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**"INSECTAE PORTORICENSIS."**

A PRELIMINARY ANNOTATED CHECK-LIST OF THE INSECTS OF PORTO RICO,  
WITH DESCRIPTIONS OF SOME NEW SPECIES.

BY

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### "INSECTAE PORTORICENSIS."

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##### INTRODUCTION.

The earliest recorded collection of insects in Porto Rico was made by Andres Pedro Ledru and is reported in his "Viaje a la Isla de Puerto Rico en el Año 1797," Paris, 1810. Of the forty-six insects listed from Porto Rico under their scientific names, ten can be readily identified:

*Termes morio* Fabr. =

*Blatta americana* L. =

*Grillus assimilis* Fabr. =

*Achaeta grillotalpa* Fab. =

*Cimex victor* Fabr. =

*Pulex penetrans* Linn. =

*Elater phosphoreus* F. =

*Passalus pentaphyllus* Latreille =

*Scarabocus tytanus* Fab. =

*Bembex signata* Linn. =

*Nasutitermes morio* Latreille

*Periplaneta americana* Linn.

*Grillus assimilis* Fabr.

*Scapteriscus vicinus* Scudder

*Proxys victor* Fabr.

*Dermatophilus penetrans* Linn.

*Pyrophorus luminosus* Illiger

*Passalus pentaphyllus* Latreille

*Strataegus titanus* Fabr.

*Stictia signata* Linn.

and one can guess at the probable identity of many of the others. Considering the time when Ledru wrote, the incompleteness of his list is not surprising, and as he lists many more species than are named, and does not omit mention of smaller and less obvious forms, such as ichneumons and ants, its real importance should not be underestimated, even though its value is mainly historic.

In 1882, Dr. Augustin Stahl of Bayamón, P. R. had published at San Juan his "Fauna de Puerto Rico," pages 82 to 102 being devoted to a discussion of the systematic classification of insects, and pages 169 to 249 to a list of specimens from Cuba, Trinidad and Porto Rico in his collection at Bayamón. Copies of his paper are now rare, and little is left of his collection, although it is reported that fragments of it still exist.

For a considerable number of years before the appearance of Stahl's paper, the German consul stationed at Mayagüez, Herr D. Leopoldo Krug, had been collecting insects, and at his instance the

eminent naturalist, Dr. Juan Gundlach, made two trips to Porto Rico, and together they collected at Mayagüez and in various other parts of the Island. Their collections were sent to Berlin, where they were studied, classified and the many new species described by various specialists. Between May 1887 and September 1893, Gundlach published the sections dealing with insects of his "Fauna Porto Riqueña" in the *Anales de la Sociedad Española de Historia Natural*, Madrid, embodying the results of their work. Herr H. J. Kolbe identified their specimens of Neuroptera, described the new species and listed the entire collection. Dr. Henri de Saussure identified the Orthoptera, but at the time Gundlach published, he did not know whether Saussure had published the descriptions of the new species, the manuscript names for which he gives. Dr. Uhler identified the Hemiptera, but apparently did not publish descriptions of the new species from Porto Rico, and Gundlach notes only a few Homoptera, as Dr. Uhler identified them only to genus. Although various specialists in small groups of Coleoptera, especially Herr. G. Quedenfeldt and Herr. J. Weise, identified or described new species from Porto Rico, a number of large and common species peculiar to Porto Rico, notably the *Lachnosterna*, are not even mentioned by Gundlach because he could not get them determined or described. Herr. Victor Von Roëder identified the Diptera, listing and redescribing about eighty species and describing eleven new species. Dr. H. Dewitz identified the Hymenoptera, excepting the ants, and described many new species. He also listed the butterflies collected in Porto Rico, and described and listed some of the moths. He was unable to work up the entire collection of Lepidoptera, which was turned over to Herr. H. B. Möschler, whose extensive paper, containing descriptions of many new species, was published posthumously by Herr. M. Saalmüller. Gundlach's paper will remain a lasting monument to his energy, perseverance and industry in advancing systematic entomology in Porto Rico.

Since Gundlach's time, various workers from the United States have supplemented portions of his list. Dr. D. W. Coquillett in the Diptera, Prof. Wm. M. Wheeler in the Formicidæ, Mr. Thos. H. Jones in the Coccidæ, Mr. J. A. G. Rehn in the Orthoptera, Messrs. Leng and Mutchler in the Coleoptera, and Dr. Nathan Banks in the Isoptera, have published important papers.

In 1914, Mr. R. H. Van Zwaluwenburg prepared a list of all determinations of insects in the collections at the two experiment stations, giving the number of the note or determination and the

host records of those at the Mayagüez (Federal) Station, of which he was at that time Entomologist. He also listed all those recorded in the literature which was available to him, but unfortunately he had neither Stahl's nor Gundlach's papers. His list was never published, but typewritten copies, together with a supplement of 15 pages, March 1915, were presented to a small number of persons or institutions especially interested.

Important advances in Entomology since the change in government in 1898 have been made in the economic field by workers at the two Experiment Stations. Since 1903, the reports of the Federal Experiment Station at Mayagüez, and a few papers devoted largely or entirely to Entomology, have contained references to many insects from an economic standpoint. Mr. O. W. Barrett was Entomologist and Botanist there from 1903 to 1905; Mr. W. V. Tower, Entomologist from 1906 to 1911, and from 1917 to the present time, Dr. C. W. Hooker in 1912, and Mr. R. H. Van Zwaluwenburg from 1914 to 1917.

With the establishment of the experiment station of the Sugar Producers' Association in 1910, an intensive study of the insect pests of sugar cane has been made, the results of which have appeared as annual reports, lists of the insect pests of sugar cane, and as bulletins or circulars of a single insect, or group of insects. Following the transfer of the station to the Insular Government, the field of entomological investigation was broadened to include all economic insects, and a great diversity of publications has appeared.

The present list is an attempt to summarize the records in literature of the occurrence of the insects in Porto Rico, together with the records of the collections at the two experiment stations; that at Mayagüez as given by Van Zwaluwenburg in his list, which includes a number, prefixed by "P. R." if considered not of economic importance, and often host records, but with locality, usually Mayagüez or vicinity, and collector unspecified; that at Río Piedras with host and locality records (Río Piedras always implied if not specified), accession numbers or collector's initials and sometimes other data.

Mr. D. L. Van Dine, the first Entomologist at the Río Piedras Station, collected all the insects, mostly from sugar cane, with accession numbers of the years 1910 and 1911 (ending in —10 or —11). Mr. Thomas H. Jones collected most of the insects listed in



1912, and those numbered from 1 to 499, 700 to 999, and 1201 to 1299 in 1913; 1 to 100 and 701 to 898 in 1914, although Mr. Van Dine made a number of collections in 1912 and a few in 1913. Mr. E. G. Smyth collected, usually at light at Guánica, those listed under 500 to 699 and 1000 to 1199 in 1913; and at Mona Island or other localities those under 1300 to 1399 in 1913; at Guánica those under 500 to 699 in 1914 and under 200 to 999 in 1915; at Río Piedras many in 1916 and most of those in 1918, 1919 and 1920. Mr. G. N. Wolcott was responsible for a few collections in 1914, those between 1 and 190 in 1915, some in 1916 and many in 1921 and 1922. Mr. R. T. Cotton collected many of the insects, especially those in citrus groves, listed in 1916 and practically all in 1917. Messrs. R. A. Crespo, E. Nelson and L. A. Catoni collected a few of the insects listed in 1918, 1919 and 1920. Mr. J. D. More collected a few insects in 1920, and those, mostly insects of cotton, or ants, under 500 to 625 in 1921 and 1922. Mr. Francisco Seín collected many insects, mostly from coffee, in 1921 and 1922.

Mr. S. S. Crossman collected some insects, mostly on tobacco or at light at Aibonito, unaccessioned, but followed by his initials (SSC) and Mr. G. B. Merrill those followed by his initials. The records followed by the initials of other entomologists represent unaccessioned specimens or field notes. The records of unlabeled specimens bear their own mute testimony to the anonymity of their collectors, but, so far as the writer is aware, Mr. Van Dine and Mr. Jones never failed to label their specimens.

Commas are used to separate the data differing in only one particular of host or locality, semicolons that differing in both host and locality, and often periods to separate the records of adult, larva and egg. Records of collections at Río Piedras are placed first and this locality is implied when none is specified.

The references to the lists of Stahl, Gundlach and the specialists who identified and listed his collections, of Van Zwaluwenburg, of Leng & Mutchler, and to the more extensive systematic papers, are given merely as the name, or initial, of the writer; those to other references by author, with the year of publication and page separated by a dash. When the insect was listed under another genus, or in synonymy, or incorrectly, the name under which it was listed is usually given before that of the authority for the record, and applies to all references on the same line or in the same paragraph.

All records, whether verified by later collections and determina-

tions, or not, have been included, but the more doubtful have been enclosed in brackets. Manuscript names given by Stahl and Gundlach are included, as some of them have been validated by publication of descriptions long after the appearance of their lists.

In 1914, several entomologists from the American Museum of Natural History, New York City, collected insects in Porto Rico, and some of the larger and more common specimens of their collections were returned as a named collection, placed first in the University of Porto Rico, later at the Insular Experiment Station, and at present what remains of the collection is in the Museum at San Juan. From a list of these specimens, made by the writer at the time of their transfer to the Station, the "AMNH" records in this list are taken.

The system of classification and the arrangement of species listed is partly accidental, and is admittedly uneven and inconsistent. In orders where inclusive lists were available, these have been followed, but for some of the smaller groups, the order of species given by Gundlach has been used.

To Dr. L. O. Howard, Chief of the Bureau of Entomology, the writer is most greatly indebted for making the preparation of this list possible, by obtaining from the specialists in the Bureau and in the National Museum the determination of specimens, and by authorizing personal consultation with these gentlemen. Not only did they determine specimens, but in some cases they revised the first draft of the section of the check-list which was submitted to them, in many cases adding new records, of specimens or from literature not available to the writer, and to each of them he is under deep obligation. In the paragraph preceding each order is given the names of the specialist, or specialists, who have determined specimens of insects of that order. In the body of the list, if this is the first record of the insect in Porto Rico, the name of the specialist making the determination is given immediately after the name of the insect and on the same line with it. If the insect was described from Porto Rico, the reference to the original description is given if known, followed by "TYPE from Porto Rico." But if the insect has been previously recorded, the name of the specialist making the determination of specimens from the collection of the Insular Station is usually given with the accession number of the particular specimen which he determined, and it does *not* refer to the determination of the host.

Mr. John R. Johnston, the first Plant Pathologist at the Río Piedras Station identified many of the plants on which Mr. Van Dine and Mr. Jones found insects feeding. But it is to his successor, Mr. John A. Stevenson, to whom the Entomological Department is most greatly indebted for such identifications, not only while he was in Porto Rico, but even after leaving the Island. Both of these gentlemen collected, in addition, a considerable number of insects. Mr. Carlos E. Chardón and Dr. N. L. Britton have also determined some host plants.

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- 22d-5 to 20. "Insect Parasite Introduction in Porto Rico." *In Jour. Dept. Agr. P. R.*, Vol. 6, No. 1, January 1922. pp. 5-20, fig. 7. San Juan, October, 1922.
- 22e-21 to 31. "The Influence of the Variety of Sugar Cane on its Infestation by *Diatraea saccharalis*, and the other Factors affecting the Abundance of the Moth-Borer." *In Jour. Dept. Agr. P. R.*, Vol. 6, No. 1, Jan. 1922, pp. 21-31, fig. 2. San Juan, October, 1922.
- 23-44 to 49. "Annual Report of the Division of Entomology." *In Ann. Rpt. Insular Expt. Sta.*, 1921-22, pp. 44-49. San Juan P. R., 1923.

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## THYSANURA.

### LEPISMIDÆ.

**Ctenolepisma reducta** Folsom, J. W., "A New Lepismid from Porto Rico" *in Proc. Ent. Soc. Washington*, Vol. 25, No. 7-8, Oct.-Nov., 1923, pp. 169-170, (Plate 14, figs. 1-8.): TYPE from Porto Rico.

from envelopes of scale-insect collection (65-23), common in libraries and with stored papers; possibly this species in dry cactus at Boquerón (GNW).



## ORTHOPTERA.

### LITERATURE.

- Burr, Malcom,** "Dermaptera (Earwigs) of the U. S. National Museum" Proc. U. S. Nat. Mus., Vol. 38, No. 1760, pp. 443-467, August 20, 1910, Washington, D. C.
- Rehn, James, A. G.,** "Notes on West Indian Orthoptera, with a List of the Species known from the Island of Porto Rico." Trans. Amer. Ent. Soc., Vol. 29, pp. 129-136, April 4, 1903.
- Rehn, James, A. G.,** "On Some Orthoptera from Porto Rico, Culabra and Vieques Islands." Bull. Amer. Mus. Nat. Hist., Vol. 28, Art. 7, pp. 73-77, March 22, 1910.
- Sein, Francisco,** "Cucarachas." Circular 64, Insular Experiment Station, Río Piedras, P. R., pp. 1-12, fig. 9, April 28, 1923.

The original records in the following list of Orthoptera are based mostly on material determined by Mr. A. N. Caudell. To him the writer is also much indebted for records of specimens in the National Museum which were collected in Porto Rico, and for bibliographic references to literature not available in Porto Rico.

### FORFICULIDÆ.

- Anisolabis ambigua** Borelli  
(as *Borellia janierensis* Dohrn) Burr 10-448.  
from young plant cane in the ground (443-12), from dead seed-cane in the ground at Fajardo (232-12).
- Anisolabis annulipes** Lucas  
Burr 10-447.
- Anisolabis maritima** Génè  
Burr 10-448.
- Anisolabis minuta** Caudell, A. N. (as *Borellia*), Jour. N. Y. Ent. Soc., Vol. 15, p. 168, 1907, TYPE from Porto Rico.  
Burr 10-448.
- Labia curvicauda** Motschler  
Wolcott 21-13: under leaf-sheaths of sugar cane.  
on coconut at San Lorenzo (12-21); under leaf-sheath of sugar cane at Mameyes (GNW).

**Labia dorsalis** Burmeister

abundant under bark of dead bucare tree, *Erythrina glauca*, at Cayey (305-17).

**Prolabia unidentata** Palisot de Beauvois (Brachypterous form).

under bark of dead bucare tree, *Erythrina glauca*, at Cayey (306-17, GNW), under banana plants at Cayey (19-21).

**Labidura bidens** Olivier

(as *L. riparia* Pall.) Gundlach, "se encuentra debajo de las cortezas sueltas de los árboles muertos."

(as *L. dufouri* Desm. = *L. pallipes* Duf.) Gundlach, "debajo de las cortezas sueltas."

(as *L. riparia* Pall.) Burr 10-451.

**Doru albipes** Fabricius

(as *Phaulx*) Van Z. (P. R. 1).

Wetmore 16-62, 116: eaten by Woodpecker and Oriole.

legs yellow and with large yellow spots at base and apex of tegmina: on sugar cane (142-21), at Guánica (142-21); in cotton square at Pt. Cangrejos (548-22); under board in garden at Guánica (EGS).

**Psalis americana** var. **gagathina** Burmeister, G., Handbuch der Entomologie, Vol. 2, p. 753, 1838, Berlin, TYPE from Porto Rico. (= *P. buscki* Rehn).

Gundlach. Burr 10-446. Van Z. (P. R. 2).

under bark of decaying bucare tree, *Erythrina glauca*, at Cayey, ovipositing (247-17); on El Duque (elev. 1600 ft.) at Naguabo (726-14); under banana plants at Vega Baja (277-22).

## BLATTIDÆ.

**Ceratinoptera diaphana** Fabricius

Rehn 10-73: from Culebra Island. AMNH at Tallaboa.

Sein 23-10: "under bark of trees, in abandoned cocoons of the 'plumilla' (*Megalopyge krugii* Dewitz), also in leaves webbed together by caterpillars and in abandoned spider nests." Illustration of adult.

on rotten wood fence at Pt. Salinas (131-15); in empty cocoons of *Megalopyge krugii* Dewitz on trunks of bucare trees, *Erythrina glauca*, at Cayey (300-17); on trunk of *Inga laurina* at Ciales (463-21), at Adjuntas (270-22), at Lares (100-22); in larval tents of *Tetralopha scabridella* Ragonot on *Inga vera* at Lares (101-22, 151-22).

**Latiblattella vitrea** Brunner

(as *Blatta vitrea* Burm.) Gundlach.

**Neoblattella adpersicollis** Stal

(possibly the *Blatta* (*Phyllodromia*) *caribaea* Saussure MS listed by Gundlach).

Rehn, James, A. G., "The Orthoptera of the Bahamas" in Bull. Amer. Mus. Nat. Hist., Vol. 22, Art. 5, p. 110, May 23, 1906, footnote: "This is the species recorded by me as *B. punctulata* from Porto Rico (Trans. Amer. Ent. Soc. XXIX, p. 130) and *B. azteca* from Porto Rico and Jamaica (*Ibid.*, XXIX, p. 268)."

**Supella supellectilum** Serville

(as *Blatta*) Gundlach, "encontrado en las casas: Mayagüez."

Seín 23-8: in house, with *Blattella germanica* Linn.

in house at Condado (498-21, 139-22), at Lares (637-21, 102-22); in hotel at Arecibo (112A-22).

**Cariblatta punctulata** Palisot de Beauvois

(as *Blatta delicatula* Guérin) Gundlach, "viene muchas veces por la noche a las casas, atraída por la luz." Stahl.

(as *Blattella*) Van Z. (P. R. 7).

(as *Neoblattella*) AMNH at Arecibo and Aibonito.

(as *Blattella*) Seín 23-11: "between the leaves of sugar cane and corn, probably feeding on the excrement of caterpillars and beetles."

(189-22), under leaf-sheaths of sugar-cane (200-11, 210-11), at San Vicente (903-14), at Arecibo (16-15), at Guánica (504<sup>1</sup><sub>2</sub>-13); under leaf-sheaths of corn, possibly feeding on excrement of *Laphygma frugiperda* S. & A. (450-17, 548-17).

**Blattella germanica** Linnaeus

(as *Blatta*) Gundlach.

(? as *Ectobia germania* ?) Van Z. (P. R. 1723).

Seín 23-7: as a pest in houses, even when kept clean: life-history and illustrations of all stages.

in house at Condado (489-21, 135-22).

**Blattella** sp. — det. Candell

on coffee leaves (172-21), in flower pot (137-22); on sugar cane at Arecibo (634-21).

**Pelmatosilpha coriacea** Rehn, J. A. G., "Studies in American Blattellidae" Trans. Amer. Ent. Soc., Vol. 29, p. 273, September 1903, TYPE from Porto Rico.

on sugar cane (4-15), on bananas at the market (87-23).

**Nauphoeta cinerea** Olivier

Stahl.

**Epilampra wheeleri** Rehn 10-73, TYPE from Utuado, Porto Rico.

(as sp.) Wetmore 16-69: eaten by Owl, *Gymnasio nudipes*.

Seín 23-11: "abundant in malojillo meadows": notes and illustration of adult.

under dead leaves in wet malojillo, *Panicum barbinode*, meadow (187-22).

**Ischnoptera adusta** Caudell, A. N., Canadian Entomologist, Vol. 37, p. 237, 1905, TYPE from Porto Rico.

**Ischnoptera blattoides** Saussure

Gundlach, "durante el día escondida en las casas."

**Ischnoptera rufa** DeGeer

Brunner, v. W. C., "Nouveau Systeme de Blattaires", 1865, p. 131.

(as *I. rufescens* Beauvois) Rehn 10-73: from Culebra Island.

**Symploce capitata** Saussure

(as *Blatta*) Stahl.

**Symploce flagellata** Hebard, Morgan, "Studies in the Group Ischnopterites" Trans. Amer. Ent. Soc., Vol. 42, p. 367, pl. xxiii, figs. 14-17, 1916, TYPE from Porto Rico.

on sugar cane (907A-14), at Martin Peña (GNW).

**Nyctibora laevigata** Palisot de Beauvois

(as *Phoetalia*) Rehn 10-73: from Utuado.

**Nyctibora** sp. nov. — det. Caudell

in rotten tree trunk, accompanied by *Eutermes morio* Latr., large yellow ants and *Strataegus* grubs, at San Sebastián (96-21).

**Periplaneta americana** Linnaeus

(as *Blatta*) Ledru 1780.

Stahl. Gundlach, "en las casas." Seín 23-4: an extended account, life-history, parasites and illustrations of adult and eggs.

in the house (309-12, 799-14, 1044-16).

**Periplaneta australiae** Fabricius

Gundlach, "Se encuentra como plaga en las casas. De día está escondida y de noche sale; corre muy pronto y vuela."

Rehn 10-75: on Culebra Island.

Seín 23-7: notes and illustrations of adults and nymph. in the house (4-13, 798-14).

**Periplaneta brunnea** Burmeister

Rehn 10-75: on Culebra Island. Seín 23-6: notes.

in the house (797-14, 33-18, 190-22, 274-22).

**Leucophaea maderae** Fabricius(as *Panchlora*) Stahl.Gundlach, "Vive como *P. surinamensis* Linn."

Rehn 10-75: from Culebra Island.

Seín 23-8: "la Cucaracha Fatula": an extended account and illustration of the adult.

in the house (322-12, 744-14, 1007-16, 45-18, 14-20), among stored papers (442-19), on the porch (179-12, 382-12), in the storeroom, eating bananas (169-21), very abundant in fruit store, especially in room where bananas are ripened, over a bushel having been killed by the proprietor (411-21, 425-21).

**Pycnoscelus surinamensis** Linnaeus

(as *Panchlora indica* Fabr.) Stahl. (as *Panchlora*) Gundlach, "vive debajo de las piedras, tablas, etc.; también en las casas, en tierra."

(as *Leucophaea*) Wetmore 16-63: eaten by Woodpecker, *Melanerpes portoricensis*.

Seín 23-11: notes. Van Z. (P. R. 68).

in box of books (874-14), in earth in box (404-12); in earth in outdoor rearing cage at Guánica (400-14, 409-14); under flower pots in garden at Lares (103-22, 150-22); under dry cow dung at Boquerón (86-23).

**Anaplecta dorsalis** Brunner, von W. C., "Nouveau systeme des Blattaires" Vienne, 1865, p. 63, TYPE from Porto Rico.**Panchlora cubensis** Saussure — det. as *P. nivea* Linn. by Mr. Caudell, but Mr. Rehn writes: "*Panchlora nivea* is not a West Indian species as far as we know today."(as *P. nivea* Linn.) Gundlach, "Vive debajo de las cortezas sueltas de los árboles muertos, o debajo de las piedras, tablas, etc."(as *P. hyalina* Saussure) Rehn 03-285.(as *P. nivea* Linn.) Seín 23-12: common in rotten coconut palm, viviparous, nymphs are brown and become the green adults in 100 days.

(413-16), in rotten interior of coconut palm by Laguna de Quiñones (258-16); (282-22, 419-22) reared adults from two females, one from rotten palm at Loíza, other from bananas.

**Panchlora exoleta** Burmeister

Rehn 03-131.

**Panchlora peruana** Saussure

Van Z. (P. R. 75).

**Panchlora virescens** Thunberg

Rehn 03-131.

**Panchlora viridis** Fabricius

Gundlach.

**Blaberus cubensis** Saussure

Van Z. (P. R. 43).

**Blaberus discoidalis** Serville

(as *B. rufescens* Sauss. — Zehntner) Rehn 03-131.

Señ 23-12: notes and illustration of adult.

(910-14, 424-21), in banana ripening room in fruit store (411-21).

**Hemibladera brunneri** Saussure

Saussure — Zehntner, Biología Centrali-Americana, Orthoptera, Vol. 1, p. 122, 1894.

**Hemibladera manca** Saussure, H., Soc. Ent., Vol. 8, p. 68, 1893, Zurich, TYPE from Porto Rico.

Rehn 10-76: from Fajardo and Culebra Island.

**Holocompsa nitidula** Fabricius

(as *H. collaris* Burm. and *H. cyanea* Burm., not in synonymy)

Gundlach, "en las casas debajo de las tablas y otros objetos."

**Plectoptera poeyi** Saussure

Wetmore 16-66: eaten by Tody, *Todus mexicanus*.

**Plectoptera porcellana** Saussure

Gundlach, "Vive debajo de las cortezas sueltas de árboles muertos y vuela de noche a veces a las casas atraída por la luz."

Van Z. (P. R. 9). Señ 23-12: notes.

(278-12), on *Psidium guajava* (305-16), on *Spondias lutea* (726-16), on grapefruit trees (459-16), at Vega Alta (47-17, 211-17); on coffee trees (79-21), at Ciales (67-21); on sugar cane at Fajardo (903-14); in caterpillar nests of *Tetralopha scabridella* Ragonot on *Inga vera* at Lares (100-22, 152-22).

**Plectoptera krugii** Saussure, H., Biología Centrali-Americana, Orthoptera, Vol. 1, p. 85, 1893, TYPE from Porto Rico.

Gundlach.

**Plectoptera unicolor** Burmeister

Gundlach.

MANTIDÆ.

**Gonatista grisea** Fabr.

(as *G. cubensis* Saussure) Stahl.

Gundlach, "sobre los arbustos en la maleza y monte."

Van Z. (P. R. 12).

in grapefruit grove (458-16); at light at Guánica (479-14); nymph resting on trunk of coffee tree at Lares (312-22 — det. GNW).

**Gonatista reticulata** Thunberg

Caudell, A. N., Psyche, Vol. 19, No. 5, pp. 160-162, 1912.



**Callimantis antillarum** Saussure

(as *Iris*) Stahl. Gundlach, "encima de la hierba de guinea en Mayagüez."

Wetmore 16-58, 61, 77: eaten by Mangrove Cuckoo, Ani and Kingbird.

resting on small tree, *Inga laurina*, at Lares (145-22 — det. GNW).

## PHASMIDÆ.

**Dyme haita** Westwood = **Bacunulus dryas** Westw.

in coffee grove at Lares (179-22).

**Dyme krugiana** Brunner, von W. C., Die Ins. Fam. der Phasmiden, p. 324, 1907, TYPE from Porto Rico.**Dyme (Bacteria) yersiniana** Saussure H., "Phasmidarum species novae non nullae", Rev. Mag. Zool., (2) Vol. 20, p. 65, 1868, TYPE from Porto Rico.

Gundlach, "en los montes o malezas".

**Bacteria calamus** Fabr.

Haan, de Willem, "Bijdragen tot de Kennis der Orthoptera" in Verhand. de Natur. Gesch. der Nederl. Overzeesch, Bezitt. etc., Orthoptera. p. 102, 1842, Leiden.

**Lamponius bocki** Redtenbacher, J., "Die Ins. Fam. der Phasmiden," p. 357, 1908, TYPE from Mona Island.**Lamponius guerinii** Saussure

(as *Pygirkhychus*) Gundlach, "Hemos cogido solamente una larva."

**Diapherodes longiscapha** Redtenbacher 08-435, TYPE from Porto Rico.**Diapherodes (gigas** Drury) **gigantea** Gmelin.

"occurs in Porto Rico" Caudell.

**Diapherodes krugii** Saussure MS name, TYPE from Porto Rico.

Gundlach, "en Mayagüez."

**Aplopus achalus** Rehn, J. A. G., Proc. Acad. Nat. Sci., Philadelphia, p. 68, 1904, TYPE from Porto Rico.

Wetmore 16-58: eaten by Mangrove Cuckoo, *Coccyzus minor mesiotetes*.

Redtenbacher 08- : possibly synonymous with *A. jamaicensis* Drury.

**Aplopus micropterus** Lep. & Serv.

Haan 42-102 and 128.

**Aplopus jamaicensis** Drury

on *Inga laurina* at Lares (104-22).

**Phibalosoma ceratocephalum** Gray

(as *Acanthoderus* (*Xylodus*) *adumbratus* Saussure, H., Orth. Nov., Rev. Mag. Zool., p. 62, 1859, — synonymy by Redtenbacher. TYPE from Porto Rico) Gundlach, "en Mayagüez."

**Canuleius cornutus** Burmeister

Haan 42-102.

**Clonistria linearis** Drury

Redtenbacher 08—

TETRIGIDÆ (ACRYDIIDÆ).

**Paratettix frey-gessneri** Bolivar

Van Z. (P. R. 8).

on malojillo grass, *Panicum barbinode*, at Pt. Cangrejos (191-22); at light (143-15, 334-21).

**Tettix caudata** Saussure

Gundlach, "en parajes húmedos, v. gr. al lado de lagunas."

ACRIDIDÆ (LOCUSTIDÆ).

**Sphingonotus haitensis** Saussure

Smyth 19-136: on sugar cane.

at light at Guánica (587-13) and up in the hills (137-15); on sandy waste land at Algarrobo (760-14).

**Orpulella punctata** DeGeer

Van Z. (det. Caudell).

in garden at Guánica (428-14, 461-14, 462-14).

**Plectrotettix gregarius** Saussure

Van Dine 13-35: eating leaves of sugar cane. Colón 19-58.

Wetmore 16-22, 61, (as sp.) 91: eaten by Cuban Green Heron, Ani and Mocking Bird.

Smyth 19-136: on sugar cane. Cotton 18-280: on beans.

(as *Stenobothrus*) Gundlach.

(as *Scyllina*) AMNH at San Juan and Mayagüez.

on sugar cane (338-12, 741-12, 206-13), at Guayama (67-13); on eggplant (51-16); on grass around "El Morro" at San Juan (987-13); at light at Guánica (719B-15); on Mona Island (1318-13).

**Schistocerca americana** Drury

on sugar cane at Guánica (719-15), at Fajardo (100-18); adults and nymphs abundant on pokeweed, *Phytolacca decandra*, at Yauco (299-21); on Mona Island (1315-13).

**Schistocerca columbina** Thunberg

(as *Schistocerca cancellatum* Serv.) Gundlach, "vive en los campos y malezas."

(as *Acridium cancellatum* Serv.) Stahl.

(as *S. aegyptia* Thunbg.) Rehn 10-76: from Culebra and Vieques Ids., from San Juan and Adjuntas.

Van Z. (P. R. 11). AMNH at San Juan, Mayagüez and Ponce.

Wetmore 16-61, 80, (as sp.) 79: eaten by Ani, Petchary and Kingbird.

Cotton 18-280: on beans. Smyth 19-136: on sugar cane.

on sugar cane at Humacao (55-10), at Guánica (462-14, 719-15); in garden (209-17, 569-16), on beans (1157-16); on grapefruit at Espinosa (90-15); on Mona Island (1316-13); nymph on *Phytolaccus decandra* at Yauco (40-23).

**Schistocerca obscurum** Fabr.

(as *Acridium*) Stahl. Gundlach.

**Schistocerca pallens** Thunberg

Van Dine 13-35: eating leaves of sugar cane. Colón 19-58.

Smyth 19-136: on sugar cane.

Wolcott 21-12: rare in cane fields.

on sugar cane at Guayama (68-13), at Mameyes (804-12), on Vieques Island (GNW); on tobacco at Cayey (331-17).

**Schistocerca peregrinum** Olivier

(as *Acridium*) Stahl. Gundlach.

## TETTIGONIIDÆ (LOCUSTIDÆ).

**Anaulacomera laticauda** Brunner

on weeds in coffee grove at Lares (106-22), on *Inga vera* at Cayey (351-22).

**Microcentrum triangulatum** Brunner

Wetmore 16-58: eaten by Mangrove Cuckoo.

Smyth 19-137: on sugar cane, not common.

at light (341-12, 342-12, 216-13, 10-15, 422-17, 20-19), at Aguirre (70-13); on grapefruit at Pueblo Viejo (456-16); nymphs feeding on leaves of sweet-potato and castor bean (83-20); on *Phytollaca decandra* L. in mountains north of Yauco (289-21); eggs on cycad (448-19), on *Ficus* sp. (GNW), very abundant on Bougainvillea leaves at Pt. Cangrejos (GNW) laid along main veins or on margin. Nymphs are variegated and bright colored, later becoming all green except at distal end of tibiae and angles of short wings, which are brown and in the last instar are all green as are the adults.

**Turpilia rugulosa** Brunner

in grapefruit grove at Vega Alta (213-17); at light (85-23).

**Neoconocephalus triops** Linn., var. **macropterus** Redt. (green) and **fuscostratus** Redt. (brown)

Wetmore 16-22, 61, 119, (as sp.) 58, 82: eaten by Cuban Green Heron, Ani, Mozambique, Mangrove Cuckoo, and Flycatcher.

(as *Conocephalus nieli* Saussure) Gundlach; from Mayagüez.

(as *Conocephalus*) Van Z. (P. R. 4).

Rehn 10-76: from San Juan and Bayamón.

Wolcott 21-12: eggs, nymphs and adults on sugar cane.

(as *N. mexicanus* Saussure) Smyth 19-136: on sugar cane.

on cane (60-12, 65-12), at Guánica (28-13, 662-14), at Toa Baja (448-21); at light (64-12, 150-15, 430-16, 145-17, 566-17, 705-17), at Guánica (586-13).

**Neoconocephalus obscurellus** Redtenbacher

(as *Conocephalus*) Van Z. (P. R. 5).

**Neoconocephalus guttatus** Serville

Rehn 10-76: from Bayamón and El Yunque.

**Homorocoryphus** sp.

Wetmore 16-61, 91: eaten by Ani and Mockingbird.

**Conocephalus cinereus** Thunberg

(as *Neoconocephalus*) Smyth 19-137: on sugar cane.

Wolcott 21-12: in cane fields where other grasses are growing.

AMNH at Arecibo, Coamo Springs and San Juan.

in tunnel of digger wasp (753-12), on grass (1211-13), in pasture (208-17), on young cane (33-17), at Vega Baja (449-21); at light (564-17), on beans (208-16, 332-17); on rice at Canovanas (189-16) but more abundant on high grass around fields; on sugar cane at Guánica (312-21).

**Conocephalus fasciatus** DeGeer

Rehn 10-76: from Vieques Island.

(as *Xiphidion*) Van Z. (P. R. 4).

**Polyancistrus serrulatus** Palisot de Beauvois

Brunner, von Wattenwyl, Carl, "Monographie der Pseudophyllidea" in Der. K. K. Zool. Botan. Gesell, in Wien, p. 233, pl. ix, fig. 101, 1895.

**Phlugis virens** Thunberg

(as *Alogopteron carribeum*) Rehn, J. A. G., in Ent. News, Vol. 14, p. 141, 1903, TYPE from Porto Rico.

**Gryllacris** sp.

on coffee leaves, in spider nest made in curled up leaves, in mountains north of Yauco (383-21, 279-21), all specimens nymphs.

## GRYLLIDÆ.

**Scapteriscus abbreviatus** Scudder — det. Chittenden, confirmed Caudell.  
one specimen (188-17).

**Scapteriscus vicinus** Scudder — the "changa".

(as *Gryllotalpa hexadactyla* Perty) Stahl. Gundlach, "Esta especie abunda en Mayagüez y vuela muy frecuentemente a la luz de las casas. Vive en la tierra donde hace daño. Por la noche, principalmente después de un aguacero fuerte, deja oír un sonido muy monótono, pero suave, producido por la fricción de sus alas; si uno se aproxima, cesa el sonido, pues el insecto percibe la pisada. Para cogerlo es menester aproximarse con sumo cuidado, averiguar donde suena y sacar con un golpe de guataca la tierra con el insecto."

Busck 00-90: "Dr. Stahl --- told me it was a comparatively new insect in Porto Rico, having been introduced within his recollection."

(as *Scapteriscus didactylus* Latr.) Barrett, O. W., "The Changa or Mole Cricket" Bul. 2, P. R. Agr. Expt. Sta. at Mayagüez, 1902. pp. 1-19. fig. 1.; an extended account, description and figure of adult, life history, natural enemies and methods of control.

(as *S. didactylus* Latr.) Rehn 10-76: from Luquillo and El Yunque.

(as *S. d.* Latr.) Van Z. (914) attacking "roots of grasses and of practically all young tender plants."

(as *S. d.* Latr.) Crossman, S. S. & Wolcott, G. N., "Control of the Changa", Circ. 6, Insular Expt. Sta., Río Piedras, 1915, pp. 1-3: control with Paris Green and flour mixture.

(as *S. didactylus*) Wetmore 16-9: "Bird Enemies of the Mole Cricket". Over half the food of the Cuban Green Heron and over quarter of the food of the P. R. Sparrow Hawk, nearly a sixth of that of the Antillean Killdeer, and a tenth of that of the Spotted Sandpiper is the changa.

Van Zwaluwenburg, R. H., "The Changa or West Indian Mole Cricket". Bul. 23, P. R. Agr. Expt. Station at Mayagüez, pp. 1-27, pl. 3, Feb. 12, 1918, Washington, D. C.: an extended account and a complete bibliography.

Cotton 18-270: a pest of vegetables and control. Illustration of adult.

adults at light (34-11, 118-11, 329-13, 807-19, 71-19), at Arecibo (13-15), at Condado (64-11), at Guánica (11-10, 546-13, 660-14, 906A-14); attacking rice (622-17); attacking tobacco at Caguas (23-10); attacking sugar cane at Fajardo (20-11), at Arecibo (179-11, 183-11), at Ponce (936-13); attacked by ants (1213-13); attacked by ants, *Pheidole fallax* var. *antillensis* Forel (det. Mann). at Saldinera, Dorado (GNW).

**Ellipes minuta** Scudder(as *Tridactylus histrio* Saussure) Gundlach.

Wetmore 16-39, 57, 89: eaten by Killdeer, Mangrove Cuckoo and Martin.

Wolcott 21-12: "in great abundance in low wet cane fields with sandy soil, at Martin Peña and Garrochales."

very abundant on sandy shore of Laguna del Tortuguero at Algarroba (774-14); at light (45-21) and swept from meadow (438-16); nymphs and adults in enormous numbers in drying-up, but still moist, ditches in cane field at Barceloneta (20-22), along margin of stream at Boquerón (105-23), averaging possibly five or six per sq. in., burrowing in the soil and apparently feeding on humus or very small roots, or resting with only head and thorax exposed.

**Cycloptilum antillarum** Redtenbacher(as *Liphoplus krugii* Saussure) Gundlach, "de los contornos de Mayagüez".**Anurogryllus muticus** DeGeer

Gundlach. Rehn 10-77: from Culebra Id. and Coamo Springs.

Wetmore 16-61, 66, 116, 119: eaten by Ani, Owl, Oriole and Mozambique.

at light (179-21); in tobacco field at Cayey (360-22).

**Gryllodes sigillatus** Walker(as *G. poeyi* Saussure) Rehn 03-135.**Gryllus assimilis** Fabr.Ledru, 1797. (as *G. cubensis* Saussure) Stahl.

(as *G. aztecus* Saussure) Gundlach, "Es especie común y dañina en jardines y huertas. De día está escondido y de noche sale a comer. Emite un sonido fuerte en proporción al tamaño de su cuerpo, incomodando si ha llegado a un dormitorio."

Wetmore 16-22, 61: eaten by Cuban Green Heron and Ani.

at light (254-12), at Guánica (327-13, 579-13); in cane field (37-12); attacking tobacco roots stems and leaves at Cayey (6-21); attacking beans and cotton, and feeding on fresh cow manure in road at Boquerón (37-23).

**Anaxipha pulicaria** Burmeister

Rehn 03-135.

**Cyrtoxipha imitator** Scudder

Rehn 03-135.

**Cyrtoxipha gundlachi** Saussure

Gundlach, "en las cercanías de Mayagüez." Van Z. (P. R. 14).

Smyth 19-137: "on sugar cane, citrus, banana".

abundant on eggplant (14-16); in leaf-sheath of corn (501-17); on grapefruit at Vega Alta (49-17).



**Hapithus tenuicornis** Walker

adults at light at Guánica (579-13).

**Orocharis vaginalis** Saussure

Gundlach, "en las cercanías de Mayagüez."

Saussure, H., Biol. Centr. Amer., Orthoptera, p. 276-7, 1897.

Van Z. (P. R. 10). Smyth 19-137: on sugar cane and citrus.

Wolcott 21-49: nymphs and adults feeding on leaves of coffee and grapefruit.

(as sp.) Wetmore 16-84, 116: eaten by Wood Pewee and Oriole.

at light (41-21, 89-21, 625-21, 73-22, 367-22), at Manatí (112-16), in all cases probably attracted from citrus trees; on grapefruit at Pt. Salinas, Plantaje (177-15), at Vega Alta (48-17, 225-17), at Vega Baja (498-17), at Santana (213-16); on coffee, eating leaves along midrib (46-21), at Jájome Alto (370-21), and observed at many points in the coffee districts; on weeds (17-16), at Cayey (321-17).

**Orocharis terebrans** Saussure, H., in Biol. Centr. Amer., Orthoptera, pp. 277, 1879, TYPE from Porto Rico.

Wetmore 16-58: eaten by Mangrove Cuckoo.

**Laurepa (Apithis) krugii** Saussure, H., "Melanges Orthopterologiques", Fasc. 5, Vol. 25, 1878, p. 607, pl. 18, fig. 64, 1 and 2: TYPE from Porto Rico.

(as *Apithis*) Gundlach.

at Bayamón (181-22); on branch of mangrove at Boquerón (180-23).

**Diatrypa sibilans** Saussure, H., 78-562, TYPE from Porto Rico.**Phalangopsis guerrina** Saussure

Stahl.

**Amphiacusta caraibea** Saussure

Rehn 10-77: from caves near Pueblo Viejo and San Juan, on El Yunque, and on Culebra and Vieques Ids.

Van Zwaluwenburg 18-26: "A Cricket Attacking Seedlings" — "a household pest of foodstuffs. The damage done to plants is similar to that caused by cutworms and is even mistaken for the work of changas. Flour and Paris green were used successfully in control." Description of eggs.

Cotton 18-270: "sick cricket", a pest of vegetables, "nocturnal in habit, hiding during the day under trash or in cracks in the soil and coming out at night to feed." Control by poison bait for grasshoppers. Illustration of adult.

in the laboratory (22-15, 66-15, 151-15, 20-16); in the cottages at Pt. Cangrejos (82-16, GNW); (determinations doubtful) in rotten tree trunk at Lares (105-22); in rotten log in mountains north of Yauco (239-22); on the beach at Arecibo under coconut husks (248-22).

**Stenogryllus** sp.

Wolcott 23-57: on coffee.

One female in hollow in coffee tree at Aibonito (489-21).  
Antennae 3 in. long, color generally light purplish-brown, with lavender bloom, eyes reddish-brown, wings and claspers dull yellow, with veination sharply outlined in brown. Many large spines on tibiae and tarsi of hind legs. Total length  $1\frac{1}{2}$  in.  
on twig of mangrove at Boquerón (179-23).

## NEUROPTERA (of Sharp).

### LITERATURE.

**Kolbe, H. J.**, "Neuroptera v. d. Sammlung von Herr Krug." Archiv. für Naturgeschichte, Vol. 1, No. 2, 1888.

### MALLOPHAGA.

**Menopon pallidum** Nitzsch—det. F. C. Bishopp  
on fowl (291-23).

### EMBIIDÆ.

**Oligotoma cubana** Hagen  
Gundlach. Kolbe.

### ISOPTERA

#### TERMITES (TERMITIDÆ of Sharp).

To Dr. T. E. Snyder, the writer is greatly indebted for the determination of all specimens of termites, the description of new species, the rearrangement of this list and the adding to it of species recorded in literature not available to the writer.

### LITERATURE.

**Banks, Nathan**, "Antillean Isoptera" Bulletin of Museum of Comparative Zoology, Vol. 62, No. 10, 1919.

**Wolcott, G. N.**, "Los Comejenes de Puerto Rico" Circ. 44, Insular Experiment Station, Río Piedras, August 1921, pp. 1-14, figs. 12.

### KALOTERMITIDÆ.

**Neotermes castaneus** Burmeister (as *Calotermes*), TYPE probably from Porto Rico.

(as *Calotermes*) Stahl. Gundlach, "Vive escondida dentro de las maderas muertas."

**Cryptotermes brevis** Walker

(as *Calotermes*) Gundlach, "Vive como la precedente." Kolbe.

(as *Leucotermes* sp.) Van Zwaluwenburg 16-44: "in woodwork and furniture, hollowing out irregular galleries with the grain of the wood, and often leaving only a very thin partition to conceal the galleries from the outside. Often the first indication of infestation by this species is the presence of fine granular droppings beneath the wood. Fumigation with hydrocyanic-acid gas" as control.

Wolcott 21-10: "polilla que destruye los muebles y las casas." A rather extended account, with illustrations of work, nymph, soldier and dealated adult: life-history and control.

in pine wood (184-22), common in houses and furniture; in telephone pole at Cayey (GNW).

**Glyptotermes pubescens** sp. nov. Snyder MS. Proc. U. S. National Museum, Washington, D. C. TYPE from Porto Rico.

one colony in interior of live coffee tree, covered with orchids, and with top dead, at Aibonito (488-21 TYPE).

**Glyptotermes corniceps** sp. nov. Snyder, T. E. "A New Glyptotermes from Porto Rico" in Proc. Ent. Soc. Washington, Vol. 25, No. 4, April, 1923, pp. 91-93, pl. 1.

one small colony in small tree at Boquerón (81-23 TYPE).

#### RHINOTERMITIDÆ.

**Lencotermes tenuis** Hagen

Banks 19-481: at Aibonito.

**Constrictotermes discolor** Banks 19-489. TYPE from Porto Rico.

Wolcott 21-3: mention.

in rotten stump of *Inga vera* in coffee grove at Ciales (216-22); in dead tree of *Inga vera* at Lares (253-22), no external nest but interior of rotten stump hollowed out and lined with

- very dark brown termite building material, runways in tree under bark.

**Tenuirostitermes wolcottii** sp. nov. Snyder MS

on dead wood of "hucar" tree, *Bucida buceras*, at Boquerón (323-23), making tunnels an inch or more broad of soil, with apparently little organic content, over the dead wood, but constructing no nest.

**Eutermes debilis** Heer

Gundlach (after Kolbe). Banks 19-482.

Wolcott 21-3: mention.

**Nasutitermes morio** Latreille

(as *Termes*) Stahl, "comején."

(as *Eutermes*) Gundlach, "Muy común y causa mucho daño cuando se ha fijado en habitaciones del campo. Su nido es visible y consiste en una masa pardo-oscuro, dura, alcanzando un gran tamaño." Kolbe.

(as *Eutermes*) Van Z. (1710). Van Zwaluwenburg 16-43: notes, and control "by placing liberal quantities of any powdered arsenical poison in the runways and nest."

Banks 19-486:

Wolcott 21-3: a rather extended account, with seven illustrations.

nest in coconut palm (108-15), on jobo, *Spondias lutea*, tree (178-21): four adults, apparently starting a colony in rotten twig of *Bixa orellana* tree at Lares (134-21); alate adults at light, June 15 (111-15).

**Nasutitermes creolina** Banks

Banks 19-484:

Wolcott 21-3: mention.

nest in algarrobo tree, *Hymenaea courbaril*, (170-21), light brown in color, the outside layers being of uniform brittle character, the interior layers very hard and tough and containing many hard balls about an inch in diameter with two or more narrow tunnels leading to the interior. The exterior tunnel to the ground was nearly an inch broad. Only workers, nasuti and immature stages found (July 8). The workers bit viciously.

**Nasutitermes sanchezi** Holmgren

Banks 19-487:

**Nasutitermes costaricensis** Holmgren

Holmgren, "Monograph Amerikanen Eutermes-Arten" Mitth. Naturh. Mus. Hamburg, Vol. 27, (1909) 1910, p. 237:

Banks, Nathan & Snyder, T. E., "Revision of Nearctic Termites" Bull. 108, U. S. National Museum, 1920, p. 82:

**CORRODENTIA.****PSOCIDÆ.****Caecilius** sp. — det. Dr. Nathan Banks

under silken shelters on the underside of mealybug infested leaves of *Erythrina glauca* (66-23).

**Pseudocaecilius wolcottii** sp. nov. Banks M. S.

under silken shelters on the underside of leaves of *Erythrina glauca* (66-23), of coconut palm (141-23).

**Peripsocus minutus** sp. nov. Banks M. S.

on bean pods of "aroma", *Acacia farnesiana*, from Boquerón (143-23).

**ODONATA.****AGRIONIDÆ.****Protoneura capillaris** Rambur

Kolbe 88-170. Gundlach.

**Ceratura capreola** Hagen

Kolbe 88-165: mention. Gundlach.

**Ischnura ramburii** Selys

Kolbe 88-170. Gundlach.

**Enallagma civile** Hagen

Kolbe 88-170. Gundlach.

**Enallagma caecum** Hagen

Kolbe 88-165. Gundlach.

**Enallagma krugii** Kolbe 88-171, TYPE from Porto Rico.  
Gundlach.

**Erythrargrion dominicanum** Selys  
Kolbe 88-172. Gundlach.

**Erythrargrion vulneratum** Hagen  
Kolbe 88-165. Gundlach.

**Leptobasis vacillans** Hagen  
Kolbe 88-172. Gundlach.

**Lestes spumaria** Hagen  
Kolbe 88-172. Gundlach.

AESCHINIDÆ.

**Gymnacantha trifida** Rambur  
Stahl. Gundlach.

**Gymnacantha nervosa** Rambur  
Kolbe 88-168. Gundlach.

LIBELLULIDÆ.

**Pantala flavescens** Fabr.  
Gundlach.

**Tramea abdominalis** Rambur  
Kolbe 88-167. Gundlach.

**Libellula umbrata** Linnaeus  
Stahl. Kolbe 88-167. Gundlach.

**Orthemis discolor** Burmeister  
Stahl. Kolbe 88-168. Gundlach.

**Lepthemis vesiculosa** Fabr.  
Kolbe 88-168. Gundlach.

**Dythemis rufinervis** Burmeister  
Stahl. Kolbe 88-168. Gundlach.

**Dythemis discreta** Hagen  
Kolbe 88-168. Gundlach.

**Macrothemis celeno** Selys  
(as *Dythemis pleurostictia* Hagen) Stahl.  
Kolbe 88-168. Gundlach.

**Diplax ambusta** Hagen  
Kolbe 88-168. Gundlach.

**Diplax portoricensis** Kolbe 88-168, TYPE from Porto Rico.  
Gundlach; comparison with *D. miniscula*.

**Perithemis domitia** Drury  
(as *Libellula metella* Selys) Stahl.

## MYRMELEONIDÆ.

**Acanthaclisis fallax** Ramb.  
Gundlach.

**Myrmeleon insertus** Hagen  
Kolbe 88-174. Stahl. Gundlach, "común":  
(? this sp.) larvae abundant in sandy soil at Guánica (160-13).

**Ascalaphus hyalinus** Latereille  
(as *Ulula*) Kolbe 88-174.  
Gundlach.

## CHRYSIDÆ.

**Chrysopa collaris** Schneider  
Gundlach. Kolbe.  
Jones 14-462 (list of insect pests of sugar cane): predaceous on *Sipha flava* Forbes. — det. Banks.  
(672-12, 239-16), adults on cane infested with the aphid, *Sipha flava* Forbes (652-12, 785-12), reared from egg, using this aphid for food (709-12), from leaves of *Erythrina* infested with mealybugs, *Pseudococcus nipae* Mask. (155-13); adults abundant on *Amaranthus* at Cayey (128-16); all stages abundant on grapefruit trees at Vega Baja (490-16) "larvae feed on eggs of *Diaprepes spengleri* Linn., also on plant lice and nymphs of *Ormenis* spp." R. T. Cotton; on trunks or foliage of grapefruit at Vega Alta (114-17, 147-17, 214-17); on coffee trees at Corozal (282-21) and occasionally noted in coffee groves in other districts; larvae feeding on *Ceroplastes* sp. scales on *Psidium guajava* (275-13).

**Chrysopa externa** Hagen  
Kolbe 88-173. Gundlach.

**Chrysopa krugii** Kolbe 88-173, TYPE from Porto Rico.  
Gundlach.

**Chrysopa thoracica** Walker  
Gundlach. Kolbe.

**Protochrysopa insularis** Walker  
Gundlach. Kolbe.

## PHRYGANEIDÆ. (TRICHOPTERA)

**Setodes candida** Hagen  
Gundlach. Kolbe.

**Chimarra albomaculata** Kolbe 88-175, TYPE from Porto Rico.  
Gundlach.  
adults common at light at Mameyes (197-13 det. Banks).





## HYMENOPTERA.

### LITERATURE.

- (Cresson, E. T., "On the Hymenoptera of Cuba." Proc. Ent. Soc. Philadelphia, January, 1865. pp. 1-200. Contains descriptions of many species found in Porto Rico.)
- Dewitz, H., "Hymenopteren von Portorico." Berliner Entomologische Zeitschrift, Vol. 25, pt. 2, pp. 197-208, 1881.
- Ashmead, W. H., "Report on the Aculeate Hymenoptera of the Islands St. Vincent and Granada, with additions to the Parasitic Hymenoptera, and a List of the Described Species of the West Indies." Trans. Ent. Soc. London, pt. 2, July, 1900.
- Hooker, C. W., "The Ichneumon Flies of America belonging to the Tribe Ophionini." Trans. Amer. Ent. Soc., Vol. 38, Nos. 1-2, pp. —, June 12, 1912.
- Crawford, J. C., "Descriptions of New Hymenoptera." Proc. U. S. National Museum, No. 6, Vol. 45, pp. 241-260, May 22, 1913.
- Viereck, H. L., "Descriptions of Ten New Genera and Twenty-five New Species of Ichneumon Flies." Proc. U. S. National Museum, Vol. 44, No. 1968, pp. 555-568, April 18, 1913.
- Wheeler, Wm. M., "The Ants of Porto Rico and the Virgin Islands." Bull. Amer. Mus. Nat. Hist., Vol. 24, Art. 6, pp. 117-158, fig. 4, pl. 2, 1908.
- Wheeler, Wm. M., "Ants." Columbia University Press, New York, March, 1910. pp. 1-663, fig. 285.
- Rohwer, S. A., "Descriptions of New Species of Hymenoptera." Proc. U. S. National Museum, Vol. 49, No. 2105, pp. 205-249, July 16, 1915.

To Mr. S. A. Rohwer the writer is most greatly indebted for the determination of many specimens and for suggesting many changes and corrections in the first draft of this section of the list. Many specimens have been determined by Messrs. A. B. Gahan, R. A. Cushman (both of whom suggested some changes in the manuscript), J. C.

Crawford, C. F. W. Muesebeck and A. A. Girault, and a few by Mrs. C. J. Weld. Dr. Wm. M. Wheeler determined most of the ants, although Dr. Wm. Mann has made some of the more recent determinations. Mr. J. D. More prepared the first draft of the section on Formicidae.

#### APIDÆ.

##### **Apis mellifera** Linn. (as **Aphis mellifica** Linn.)

Dewitz. Stahl. Gundlach, "Esta especie fué introducida de Europa y existe ahora, no solamente en los colmenares, sino también cimarrona en árboles huecos de los montes y en las grietas de las peñas."

Busck 00-90: "Very large colonies of a dark variety of *Apis mellifica* were abundant in hollow trees and especially in caves, sometimes also in outhouses. These are annually smoked out and furnish large quantities of honey."

Tower, W. V., "Bee Keeping in Porto Rico." Circ. 13, P. R. Agr. Expt. Station, Mayagüez, 1913, pp. 1-31, fig. 1.

Phillips, E. F., "Porto Rican Bee Keeping." Bull. 15, P. R. Agr. Expt. Station, May 29, 1914, Washington, D. C., pp. 1-24, pl. 2.

Van Zwaluwenburg, R. H. & Vidal, Rafael, "Rearing Queen Bees in Porto Rico." Circ. 16, P. R. Agr. Expt. Station, Feb. 26, 1918, Washington, D. C., pp. 1-12, fig. 5.

Wetmore 16-77: worker eaten by Kingbird.

#### ANTHOPHORIDÆ.

##### **Centris haemorhoidalis** Fabr.

Dewitz. Gundlach. Van Z. (P. R. 53).  
(614-12 det. Rohwer.)

##### **Centris lanipes** Fabr.

Dewitz. (as *C. fulviventris* Cresson and *C. dentipes* Smyth, not in synonymy) Stahl.

Gundlach, "en Mayagüez."  
(724-13 det. Rohwer.)

##### **(Centris ornatifrons** Cresson Stahl.)

##### **Centris versicolor** Fabr.

Dewitz. Stahl. Gundlach, "común." Ashmead.

Wetmore 16-77: eaten by Kingbird.

(as *C. decolorata* Sip. — a misidentification) Van Z. (P. R. 44).  
on the beach at Arecibo (272-22).

##### **Exomalopsis pulchella** Cresson

Dewitz. Stahl. Gundlach, "común." Ashmead.

**Exomalopsis similis** Cresson

Dewitz. Stahl. Gundlach, "común." Ashmead.

**Exomalopsis globosa** Fabr.—det. Crawford

tunneling in hard clay at Guánica (GBM)

**Anthophora krugii** Cresson, E. T., Proc. Acad. Nat. Sci., Philadelphia, 1878, p. 188, TYPE from Porto Rico.(as *Magilla tricolor* Fabr.) Stahl.(as *A. tricolor* Fabr.) Dewitz. Gundlach, "Mr. Cresson --- la considero distinta de la *A. tricolor*."

Van Z. (P. R. 45). Wetmore 16-77: eaten by Kingbird.

adults on flowers (7-117), at Aguirre (371-13); abundant on tomato flowers (132-17); about 100 resting and flying about in weeds, *Parthenium hysterophorus*, in sunshine at mid-day (448-12); emerging from burrow in bank at side of road, south of Ciales (464-21).**Melissodes mimica** Cresson

Stahl. Gundlach.

**Melissodes trifasciata** Cresson, E. T., Proc. Acad. Nat. Sci., Philadelphia, 1878, p. 208, TYPE from Porto Rico.

Stahl. Gundlach.

(561-12)

## XYLOCOPIDÆ.

**Xylocopa brasilanorum** Linn.—det. Rohwer(as *Xylocopa acnipennis* Linn.) Van Z. (P. R. 48).(as *Xylocopa morio* Fabr.) Dewitz. Stahl. Gundlach, "Es notable por la diferencia de colorido entre el macho y la hembra (males are yellow, females black). Las larvas viven dentro de la madera en divisiones separadas en un tubo común, una encima de otra."(73-19), a male on *Lantana* (254-17); adults at Guánica (534½-13), at Aibonito (SSC), tunneling in fence post at Loíza (260-16).

## MELECTIDÆ.

**Crocisa pantalon** Dewitz 81-198, TYPE from Porto Rico.

Gundlach, "rara."

**Nomada krugii** Cresson, E. T., Trans. Amer. Ent. Soc., Vol. 7, p. 75, 1878, TYPE from Porto Rico.(as *N. cubensis* Cresson) Dewitz. Gundlach. Ashmead. Ashmead.**Melissa rufipes** Perty

Stahl.

## MEGACHILIDÆ.

**Hypochrotaenia (Pasites) pilipes** Cresson

Dewitz. Gundlach. Ashmead.

**Coelioxys abdominalis** Guerin

Dewitz. Stahl. Gundlach, "en Mayagüez." Van Z. (P. R. 79).

**Coelioxys producta** Cresson

Stahl.

**Coelioxys spinosa** Dewitz 81-197, TYPE from Porto Rico.

Gundlach.

**Megachile insularis** Cresson

Ashmead.

**Megachile martindalei** Fox—det. Rohwer

on bean flowers (688-17).

**Megachile poeyi** Guerin

Dewitz. Stahl. Gundlach. Ashmead.

(as sp.) Wetmore 16-61: eaten by Ani.

**Megachile singularis** Cresson

Dewitz. Gundlach.

**Megachile vitraci** Pérez—det. Rohwer

the rose-leaf cutting bee, nesting in bamboo (130-22): on  
Mona Island (1311-13).

PANURGIDÆ.

**Panurgus parvus** Cresson

Dewitz. Gundlach. Ashmead.

ANDRENIDÆ.

**Agapostemon krugii** Cresson MS name (Gundlach)

Differs from *A. poeyi* in having base and nerves of wings, and  
oceli and legs *black*.

at Jájome Alto (69-15).

**Agapostemon poeyi** Lucas

Dewitz. Gundlach.

at Vega Alta (156-15).

**Agapostemon radiatus portoricensis** Cockerell, T. A. P., Proc. U. S.

Nat. Mus., Vol. 55, No. 2264, 1919, p. 209, TYPE of variety  
from Mayagüez, Porto Rico.

(as *A. festivus* Cresson) Dewitz.

(as *A. tricolor* Lepel.) Gundlach, — a difference from *A. fes-*  
*tivus* of Cuba noted by Gundlach and identified as *A. tricolor*  
Lepel. by Cresson. Ashmead. Stahl.

Differs from *A. festivus* in having abdomen *brown* above,  
with basal margin of first four segments of abdomen *yellow*.  
Adults swept from grass at Pt. Cangrejos (GNW); twenty  
or thirty in a cluster on grapefruit leaves at Manatí (216-  
16 det. Rohwer).

**Augochlora parva** Cresson

Dewitz. Stahl. Gundlach. Ashmead.  
(as sp.) Wetmore 16-77: eaten by Kingbird.

**Augochlora busckii** Cockerell, T. D. A., Proc. U. S. Nat. Mus., Vol.

37, No. 1717, p. 493, Feb. 2, 1910, TYPE from Porto Rico.

**Halictus poeyi** Lepeletier

Ashmead. (as sp.) Wetmore 16-84: eaten by Wood Pewee.

## VESPIDÆ.

**Polistes crinitus** Felton—det. Rohwer

(as *Polistes americanus* Fabr.) Dewitz. Stahl. Gundlach. Ashmead.

Van Z. (P. R. 57).

Jones & Wolcott 22-41: predaceous on pupa of *Prenes nero* Fabr.  
(as sp.) Wetmore 16-77, 80, 82, 84: eaten by Kingbird, Petchary, Fly-catcher and Wood Pewee.

at Ponce (109-13), at Añasco (41-10), at Cayey (325-17),  
at Aibonito (SSC), at Guánica (455-13). Predaceous on *Prenes nero* Fabr. chrysalis (32-21).

**Polistes canadensis** Linnaeus

Wetmore 16-77: eaten by Kingbird.

**Megacanthopus cubensis** Saussure

(as *Polybia*) Stahl. Ashmead.

in coffee groves in the mountains, at Ciales (77-21 det. Rohwer, 460-21, 218-22); in grapefruit grove at Vega Alta (516-16, 115-17); on El Duque at Naguabo (729-14).

**Megacanthopus indeterminabilis** Saussure

(as *Polybia mexicanus* Sauss.) Ashmead.

Van Z. (P. R. 66).

**Polybia phthisica** Fabr.

Dewitz. Gundlach. Ashmead.

## EUMENIDÆ.

**Zethus rufinodus** Latreille

Dewitz. Stahl. Gundlach, "rara en Puerto Rico."

Van Z. (P. R. 46).

on flowers at Lares (99-22 det. Rohwer).

**Eumenes ornatus** Saussure

Dewitz. Stahl. Gundlach. Van Z. (P. R. 205).

var. *abdominalis* Drury — det. Rohwer, at Guánica (6-13, 981-16), at Pt. Cangrejos (167-15).

**Monobiella atrata** Fabr.

(as *Odynerus aethiops* Cresson MS) Stahl.

(as *Rhynchium atratum* Fabr.) Dewitz. Gundlach.

**Odynerus bucuensis** Saussure (MS)  
Stahl. Gundlach.

**Odynerus dejectus** Cresson  
Dewitz. Stahl. Gundlach, (as *O. cressoni* Sauss.). Ashmead.  
(as sp.) Wetmore 16-80: eaten by Petchary.

**Odynerus (Pachodynerus) tibialis** Saussure  
AMNH

PSAMMOCHARIDÆ (POMPILIDÆ).

**Pepsis caerulea** Linn.  
(as *P. speciosa* Fabr., synonymy by Gundlach) Dewitz. Ashmead.  
Gundlach.

**Pepsis marginata** Palisot de Beauvois  
Stahl.  
adults on flowers (306-12, 584-16, 517-18).

**Pepsis heros** Dahlbom  
Dewitz. Gundlach. Ashmead.  
(as sp.) Wetmore 16-77: eaten by Kingbird.  
adults near the beach at Santa Isabel (369-13), at Pt. Can-  
grejos, (396-22).

**Pepsis rubra** Drury—det. Rohwer  
(626-12), at Pt. Cangrejos, feeding on flowers of *Mitracarpus*  
*portoricensis* (395-22), at Aguirre (69-16), at Santa Isabel  
(369-13).

**Pepsis ruficornis** Fabr.  
Dewitz. Stahl. Gundlach. Ashmead.  
(two unlabeled specimens)

**Psammochares cubensis** Cresson  
(as *Pompilus anceps* Cresson) Stahl. Gundlach.  
(as *Pompilus*) Ashmead.

**Psammochares (Pompilus) coruscus** Smith  
Gundlach, "algo rara." Dewitz.

**Psammochares (Pompilus) cressoni** Dewitz 81-203, TYPE from Porto  
Rico.  
Gundlach, "rara."

**Psammochares ferrugineus** Dahlbom  
(as *Pompilus*) Dewitz. Gundlach, "rara." Ashmead.

**Psammochares fulgidus** Cresson  
(as *Pompilus*) Dewitz. Gundlach, "cogida en Quebradillas."

**Psammochares navus** Cresson  
(as *Pompilus*) Gundlach.



**Pompiloides propinquus** Fox—det. Rohwer  
(648-12), at Guayama (668-17).

**Batazonus flavopictus** Smith  
(as *Pompilus*) Gundlach, "rara."

**Batazonus hookeri** Rohwer 15-237, TYPE from Mayagüez, Porto Rico.  
at Ponce (109-13)

**Batazonus mundus** Cresson  
(as *Pompilus concinnus* Cresson) Dewitz.  
(as *Pompilus*) Gundlach. Ashmead.

**Cryptocheilus flammipennis** Smith  
(as *Pompilus ignipennis* Cresson) Dewitz. Ashmead.  
(as *Pompilus*) Gundlach, with *P. ignipennis* in synonymy,  
"rara."  
at Cayey (26-21).

**Pseudagenia bella** Cresson  
(as *Pompilus*) Dewitz. Gundlach, "en Mayagüez." Ashmead.  
Van Z. (det. Rohwer).

## CRABRONIDÆ.

**Crabro croesus** Lepeletier  
Dewitz. Gundlach, "Los ejemplares de Puerto Rico diferentes  
en algo del tipo cubano—en el color de la pubescencia."  
Van Z. (P. R. 64).

**Crabro mayeri** Dewitz 81-201, TYPE from Porto Rico.  
Gundlach, "en los contornos de Mayagüez."

**Psen (Mimesa) modesta** Rohwer 15-244, TYPE from Mayagüez,  
Porto Rico.

**Cerceris krugii** Dewitz 81-201, TYPE from Porto Rico.  
Gundlach, "en varias localidades."  
(as sp.) Wetmore 16-98: eaten by Jamaican Vireo.

**Cerceris margaretella** Rohwer 15-248, TYPE from Mayagüez, Porto Rico.

**Trachypus gerstaeckeri** Dewitz 81-202, TYPE from Porto Rico.  
Gundlach, "en Mayagüez."

## NYSSONIDÆ.

**Nysson (Bathystegus) basirufus** Rohwer 15-247, TYPE from Mayagüez, Porto Rico.

**Hoplisus (Hoplisoides) scitulus** Cresson—det. Rohwer  
(891-13).

BEMBECIDÆ.

**Bembex ciliata** Fabr.

Dewitz. Stahl. Gundlach, "vive en las playas." Ashmead.  
at Santa Isabel (419-13 det. Rohwer).

**Bembex regularis** Cresson

Stahl.

**Stictia signata** Linn.

(as *Bembex*) Ledru 1797. Dewitz. Stahl.

(as *Monedula*) Gundlach, "común en terrenos arenosos, cavando allí hoyos con mucha prontitud. Apenas se le ve posarse, pues vuela prontamente como jugueteando un individuo con otro."

at Algarrobo (759-14), at Trujillo Alto (888-13), at Dorado around icaco blossoms (715-13), on sandy ground at Vega Alta (169-15); chasing *Chrysops costatus* Fabr. on horses at Pt. Salinas (GNW), chasing flies attracted to molasses (182-21 det. Rohwer).

**Microbembex monodonta** Say—det. Rohwer

(one unlabeled specimen.)

LARIDÆ.

**Notogonidea fuliginosa** Dahlberg

(as *Larrada*) Stahl. Gundlach.

**Notogonidea ignipennis** Smith

(as *Larrada*) Dewitz. Gundlach, "en Quebradillas."

Van Z. (P. R. 71).

at Ponce (108-13 det. Rohwer), on cane at Guánica (GNW).

**Notogonidea luteipennis** Cresson

(as *Larrada*) Dewitz. Stahl. Gundlach.

**Notogonidea trifasciata** Smith

(as *Larrada*) Dewitz. Stahl. Gundlach. Ashmead.

**Notogonidea vinulenta** Cresson

(as *Larrada*) Gundlach.

Van Z. (det. Rohwer).

**Tachytes argentipes** Smith—det. Rohwer

(650-12, 684-12, 125-17, 138-17), on corn leaves at Aguadilla (25-22).

**Tachytes insularis** Cresson

Dewitz. Gundlach, "rara."

**Prionoyx thomae** Fabr.

Dewitz. Stahl. Gundlach. (as *Chlorion*) Van Z. (P. R. 1011).  
(as sp.) Wetmore 16-77: eaten by Kingbird.

(as *Sphex*) AMNH.

(768-12) on dry hill at Ponce (107-13), at Isabela, carrying off small grasshopper, larger than herself (210-21).

**Ammobia dubitata** Cresson—det. Rohwer

(as *Chlorion*) Van Z. (P. R. 93).

(803-14); with *Onocephalus fasciatum* DeG. in her burrow (675-12).

**Ammobia ichneumonea** Linn. var. *auriflua* Perty

(as *Sphex croesus* Fabr. and as *S. auriflua* Perty) Stahl.

(as *Sphex*) Dewitz. Gundlach, giving also determination by Saussure as *Sphex croesus*.

(as *Sphex* and as *Sceliphron*) Ashmead.

on flowers at Pt. Cangrejos (606-17).

#### SCOLIIDÆ.

**Elis haemorrhoidalis** Fabr. = **Elis (Myzine) sexcincta** Fabr.

(as *Myzine sexcincta* Fabr., with *Myzine nitida* Cr. and *Tiphia haemorrhoidalis* Fabr. in synonymy with different specimens) Stahl.

(as *Myzine sexcincta* Fabr.) Dewitz. Gundlach. Aldrich.

(as *Elis sexcincta* Fabr.) Van Dine 13-29; Van Dine 13-254 and Smyth 17-55: mention.

Van Z., as parasitic on *Lachnosterna* spp.

(as *Elis sexcincta* Fabr.) Wetmore 16-82: eaten by Flycatcher.

Wolecott, 22d-14: parasite of grubs of *Phytalus insularis* Smyth.

males common on sandy land, in clusters of hundreds, resting on weeds, or flying about close to the soil, at Trujillo Alto (885-13), at Algarrobo (766-14), at Guánica (663-14), at Pt. Cangrejos (GNW), on Vieques Id. (GNW). Females with stouter bodies, in cane field at Barceloneta (17-22), in grapefruit grove (281-16), feeding on excrement of *Aphis gossypii* Glover on cotton at Isabela (218-21).

Both sexes reared from cocoons collected in plowed field at Plantaje, Pt. Salinas, in outer threads of which were entangled the mandibles of *Phytalus apicalis* Blanchard (= *P. insularis* Smyth) third instar grubs (64-22). From some cocoons a hyperparasite, *Anthrax gorgon* Fabr. (64A-22) emerged.

**Elis ephippium** Fabr.

(as *Myzine*) Gundlach, "rara." Ashmead.

(as *Tiphia*) Dewitz.

(as *Myzine apicalis* Cresson—described from a male) Stahl. Gundlach, "común --- acaso sea la misma que *M. ephippium* Fabr."

(as *Elis xanthonotus* Rohwer 15-234, TYPE (113-12) from Porto Rico.)

Rohwer, S. A., Proc. U. S. Nat. Mus., Vol. 57, No. 2312, 1920, p. 228: synonymy of *E. xanthonotus*, described from a female, with *Elis ephippium* Fabr.

(as *Elis xanthonotus* Roh.) Smyth 17-55: mention.

(as sp.) Wetmore 16-77: eaten by Kingbird.

Wolcott 22d-14: mention.

females (113-12), on flowers (1212-13), in greenhouse (365-19), one male (unlabeled) agrees with Cresson's description of *Myzine apicalis* except that the femora are piceous on basal half, extending to apex beneath, otherwise yellow, and all tibiae are yellow. "The female wasps occur on the flowers of *Hyptis atrorubens*, the males on those of *Mitracarpus portoricensis*. The male wasps differ greatly from the female, being slender with yellow stripes, and the characteristic up-turned genital organ." E. G. Smyth.

### **Myzine nitida** Smith

Stahl.

### **Tiphia argentipes** Cresson

Dewitz. Stahl. Gundlach, abundant. Ashmead.

(as sp.) Wetmore 16-77: eaten by Kingbird.

### **Tiphia** sp. (possibly the above)

Wolcott 22d-12; Wolcott 23-55: notes.

three males collected by Mr. E. H. Barrow, feeding on secretions of a scale, *Pulvinaria psidii* Mask., on *Rauwolfia nitida* at Guánica, (243-21) — "closely allied to *floridana* Robertson and *illinoiensis* Robertson" — det. Rohwer, another male, same data (318-21), another male on cotton at Yauco (39-22).

### **Campsomeris atrata** Fabr.

(as *Scolia*) Dewitz. Stahl. Gundlach, "muy común; su vuelo es lento y con ruido visita las flores."

Ashmead. Wolcott 22d-14: mention.

from flowers in cane field at Aguirre (370-13); a female at Lares (13-23).

### **Campsomeris dorsata** Fabr.

(as *Tiphia*) Dewitz. (as *Scolia*) Stahl. Gundlach, "rara."

Van Z. (P. R. 43).

Van Dine 13-254; Colón 19-51; Smyth 17-55: mention.

Wetmore 16-77, 80, 91: eaten by Kingbird, Petchary and Mockingbird.

Smyth 19-141; Wolcott 21-44; Wolcott 22d-14: parasitic on grubs of *Ligyris tumulosus* Burm.

"While I was getting these grubs (of *Ligyris tumulosus* Burm.) I found 28 cocoons of a wasp, very probably the black one with two reddish bands across the abdomen, because while digging, two flew out. This wasp is commonly seen in the callejones and cane fields. I also found one grub with a large size larva of a wasp attached to its body, one grub with a

medium sized larva attached to it, and one with the egg of the wasp freshly laid on its body" letter of H. Bourne (June 20, 1913) from Hacienda Santa Rita, Guánica, P. R. Reared to adult (495-13).

common on south (dry) side of the island on sandy land, feeding on the nectar of flowers or resting on cane leaves, at Guánica or Yauco, (46-11, 48-11, 232-11, 380-12, 99-13, 100-13, 106-13, 504-13, 136-21, 241-22), at Ponce (68-15), at Aguirre (372-13), at Arroyo (101-16).

on the north side (580-12), at Maunabo (666-17), at Trujillo Alto (889-13), at Arecibo (18-15).

**Campsomeris pyrura** Rohwer 15-235, TYPE from Mayagüez, Porto Rico.

Smyth 17-55, Wolcott 22d-14: mention.

on flowers of *Stachytarpheta jamaicensis* near Comerío (771-13).

**Scolia plumipes** Drury

Dewitz. Gundlach, "rara."

**Campsomeris trifasciata** Fabr.

(as *Tiphia*) Dewitz. (as *Scolia*) Stahl. Gundlach, "común."

Van Z. (P. R. 42). Smyth 17-55; Wolcott 22d-14: mention.

(as sp.) Wetmore 16-77, 80: eaten by Kingbird and Petchary.

(749-12, 740-12, 926-13), at San Juan (990-13), at Maunabo (667-17).

**Campsomeris maculata** Drury = **C. druryi** Ckll. — synonymy by Rohwer  
Ashmead.

**Campsomeris tricineta** Fabr.

Ashmead. (as *Scolia*) Stahl. Gundlach.

#### FORMICIDÆ.

(The first draft of this section was prepared by Mr. J. D. More.)

#### PONERINÆ.

**Platythyrea punctata** F. Smith

Wheeler: between Arecibo and Utuado, "in a shady cafetal."

**Euponera (Pseudoponera) stigma** Fabr.

Wheeler: in Culebra Island and at Utuado, "nesting under stones or logs."

**Ponera opaciceps** Mayr

Wheeler: on Culebra Id., at Utuado, Monte Morales, Monte Mandios and at Coamo Springs, "under bark of decaying logs in damp places."

Wetmore 16-87: eaten by Swallow.

**Ponera ergatandria** Forel

Wheeler: at Utuado.

**Anochetus mayri** Emery

Wheeler: at Utuado, Vega Baja, Monte Morales and Monte Mandios, at Coamo Springs, San Juan, Adjuntas, Arecibo, "common under dead leaves and stones in the shade of cafetals and platanals."

**Anochetus (Stenomyrmex) emarginatus testaceus** Forel

Wheeler: on Culebra Id., "along dry arroyos on the higher part of the island."

**Odontomachus haematodes** Linn.

Wheeler: at many localities, "common, nesting under stones or logs or in untidy mound nests about the roots of trees, but only in shady places and rather rich soil."

Wetmore 16-80: eaten by Petchary.  
at Ciales in rotten stump (59-21).

**Odontomachus haematodes** Linn., subsp. **insularis** Guerin, var. **ruginodis** Wheeler—popularly known as "berraco".

Wheeler: at Utuado, Adjuntas, Coamo Springs, "less common—in open sunny places in sandy soil of river bottoms."

Wetmore 16-91: eaten by Mockingbird.  
(705-16, 1117-16), at base of tree (267-12), in rotten coconut husks (183-21), with *Pseudococcus sacchari* Ckll. under leaf-sheaths of sugar cane (162-11); at roots of sugar cane at Guánica (226-11), on Vieques Id. (GNW); on sugar cane at Guayanilla (GNW).

MYRMICINAE.

**Pseudomyrma flavidula** F. Smith

Wheeler: a single worker at Tallaboa.

**Pseudomyrma flavidula** Smith, var. **delicatula** Forel—det. Wheeler

on trunk of rotten tree and on sugar cane (323-12); on coffee tree at San Germán (399-21); on cotton at Pt. Canarejos (605-22); in termite nest at Ciales (612-22).

**Monomorium destructor** Jerdon

Wheeler: "a single colony nesting at the base of *Acacia farnesiana* tree at Tallaboa." Van Z. (P. R. 1013).

**Monomorium minutum** Mayr

Van Z. (P. R. 622).

**Monomorium pharaonis** Linn.

Wheeler: "common in houses and hotels—also nesting out of doors in the ground on Culebra Id."

Van Z. (P. R. 1014).  
in houses (153-11, 681-12).



**Monomorium carbonarium** F. Smith, subsp. **ebeninum** Forel

Wheeler: on Culebra Id., and at many places in Porto Rico  
 "under stones, in Tillandsias and under bark."

Van Z. (P. R. 322).

Van Dine 13-32, Jones 16-15, Colón 19-30: attending *Sipha flava* Forbes on sugar cane.

nesting under leaf-sheaths of sugar cane (161-11), in tunnel of *Diatraea saccharalis* Fabr. in sugar cane (204-11), attending *Sipha flava* Forbes on young sugar cane (328-12, 333-12), on seed cane (721-12) — all det. Wheeler — nesting in cabbage head (408-19) tunneling among the inner leaves; under cow dung (268-12); attacking larva of *Desmia ufeus* Cramer (601-21); attending *Sipha flava* Forbes on sugar cane at Guánica (227-15); on coffee at San Sebastián (604-21); "injurious to the fruits of roselle, *Hibiscus sabdariffa*, by nesting in them." E. G. Smyth.

**Monomorium floricola** Jerdon

Wheeler: "common in Tillandsias, under bark-scales of trees and in hollow twigs."

Van Z. (P. R. 1015).

Wetmore 16-63: eaten by Woodpecker.

(142-11), carrying away dead flies (455-12), on cotton (355-21); in tunnel of *Diatraea saccharalis* Fabr. in sugar cane at Humacao (51-13); nesting in hollow twigs on coffee at Lares (151-20), at Peñuelas (397-21), at Sabana Grande (398-21), at San Germán (400-21), in empty cocoon of *Megalopyge krugii* Dewitz on coffee at Caguas (112-21).

**Cardiocondyla emeryi** Forel

Wheeler: on Vieques and Culebra Ids., and at many places in Porto Rico, "The colonies — are small and in sandy places, especially in river or creek bottoms and on sea beaches."

Wetmore 16-63: eaten by Woodpecker.

**Cardiocondyla venustula** Wheeler 08-128, TYPE from Coamo Springs, Porto Rico.

Wheeler: in small colonies in sandy and gravelly beds of streams or on sea-beaches. Also from Culebra Id. Illustration of worker.

Wheeler 10-126: same illustration.

Wetmore 16-87: eaten by Swallow.

**Solenopsis geminata** Fabr., the "hormiga brava."

Barrett, O. W., "Control of the Brown Ant (*Solenopsis geminata* Fabr.) in Orange Orchards." Circ. 4, P. R. Agr. Expt. Station, May 9, 1904. pp. 1-3.

Barrett 05-388: injurious to citrus trees.

Tower, W. V., "Control of the Brown Ant (*Solenopsis geminata* Fabr.) and the Mealy Bug (*Pseudococcus citri* Risso) in

Pine-Apple Plantations." Circ. 7, P. R. Agr. Expt. Station, (no date) pp. 1-3.

Wheeler: "commonest of all the ants — except in — Culebrita. — This ant not only stores up seeds in its nests and is highly carnivorous, but it also attends aphids and coccids." With *Aphis nerii* Boyer on milkweed at Culebra.

Wheeler 10-126: on Culebra Id.

Tower 11a-11: injury to citrus groves and methods of control.

Van Dine 11-29; Van Dine 12-20; Van Dine 13-30: attending *Pseudococcus sacchari* Ckll. on sugar cane.

Van Dine 13-32; Jones 15b-15: attending *Sipha flava* Forbes on sugar cane.

Jones 15b-17: attending *Aphis setariae* Thos. on sugar cane.

Van Z. (P. R. 311).

Jones 15-9: injuring okra plants.

Wetmore 16-40, 61, 66, 74, 116, 119, 128: eaten by Killdeer, Ani, Tody, Mango, Oriole, Mozambique, and Grasshopper Sparrow.

Cotton 18-296: injuring eggplant.

Colón 19-32: summary of injuries.

Wolcott 22-10: protecting aphids.

Smyth 19-138: "injures citrus, cowpeas, eggplants and bananas." attending *Pseudococcus sacchari* Ckll. on sugar cane (147-11, 595-12), at Guánica (288-11); attending *Pseudococcus nipae* Mask. on *Psidium guajava* (270-12); attending *Saissetia hemisphaerica* Targ. on coffee at Lares (162-20); attending *Toxoptera aurantiae* Boyer on mamey at Ciales (602-21); attending *Sipha flava* Forbes on sugar cane (330-12) and *Aphis setariae* Thos. on sugar cane (92-13); with *Liburnia* sp. on Guinea grass (108-12); carrying off dead insects (63-10). Attracted by juice from freshly-cut sugar cane (720-12), of corn (331-21), of bean (784-14); injuring corn (154-11), eggplant (180-16, 483-16); at base of palm (342-21); in tobacco seed beds at Caguas (24-10).

**Solenopsis globularia** F. Smith, var. **borinquenensis** Wheeler 08-131, TYPE of var. from El Morro at San Juan, Porto Rico, and from Culebra Id.

Wheeler: nesting "in the white sand of the sea-beaches just above high-water mark." Illustration of worker.

Wetmore 16-93: eaten by Thrush.

**Solenopsis corticalis** Forel

Wheeler: in the stem of a bamboo at Utuado.

**Solenopsis picea** Emery

Wheeler: under bark of rotten log at Utuado.

**Solenopsis azteca** Forel, var. **pallida** Wheeler 08-131, TYPE of variety from Coamo Springs, Porto Rico.

Wheeler: "a small nest under a boulder in a dry stream bed."

**Cremastogaster victima** F. Smith, var. **steinheili** Forel

Wheeler: "common — under bark or in hollow twigs." Sheds built over coccids on leaves of *Cordia macrophylla* by colonies at Culebra Id.

Wheeler 10-223: construction of "carton nests" on Culebra Id. attending mealy-bugs on *Croton* at Yauco (600-22); attending *Toxoptera aurantiae* Boyer on mamey at Plantaje (603-22); on cotton at Villalba (609-21); in dead coffee twigs at Guayama (111-21); nesting in old cocoons of *Megalopyge krugii* Dewitz on citrus tree at Fajardo (468-12).

**Pheidole fallax jelskii** Mayr var. **antillensis** Forel

Wheeler: at many places in Porto Rico and on Culebra Id. Van Z. (P. R. 1018).

Wetmore 16-91, 93, 119: eaten by Mockingbird, Thrush and Mozambique.

nesting under cement walk (159-11); nesting in cane field and attacking live changa, *Scapteriscus vicinus* Scudder, at Sardinera, Toa Baja (163-20); attacking live female wasp, *Campsomeris dorsata* Fabr. at Yauco (135-21).

**Pheidole megalocephala** Fabr.

Wheeler: at many places in Porto Rico, and on Culebrita Id.

Wheeler 10-155: absent in Culebra Id., abundant in Culebrita. Van Z. (P. R. 1020).

attending *Pseudococcus* sp. (609-12), attacking caterpillars (736-19), driving away *Solenopsis geminata* Fabr. (GNW).

**Pheidole subarmata** Mayr, var. **borinquenensis** Wheeler 08-133, TYPE of variety from Porto Rico.

Wheeler: "only a few soldiers and workers in a colony — in sandy, sunny places like roads and creek bottoms." Illustrations of soldier and worker.

Wheeler 10-99: same illustrations.

Wetmore 16-129: eaten by Grasshopper Sparrow.

**Pheidole flavens sculptior** Forel

Wheeler: a single soldier at Coamo.

**Pheidole flavens exigua** Mayr

Wheeler: redescribed. "Colonies — under logs and stones in open woods and cafetals." At Utuado and Coamo. on *Inga vera* at Cayey (619-22).

**Pheidole moerens** Wheeler 08-136, TYPE from Utuado, Porto Rico, from under stones and prostrate plantain trunks in the woods and cafetals. Illustrations of soldier and worker.**Macromischa isabellae** Wheeler 08-138, TYPE from Monte Morales and Monte Mandios, Porto Rico, from colonies under the roots of an epiphytic orchid and in a hollow twig. Illustrations of workers.

Wheeler 10-128: same illustrations.

Wolcott 23-57: on coffee.

in mountains north of Yauco on coffee (405-21), on *Inga vera* (611-22), nesting in old stump (608-22).

**Macromischa albisipina** Wheeler 08-139, TYPE from Culebra Island, one colony in the ground in the shade of a thicket. Illustrations of workers.

Wheeler 10-128: same illustrations.

**Tetramorium guineense** Fabr.

Wheeler: on Culebra Id., eating papaya, (*Carica papaya*, fruit.

Van Z. (P. R. 1016):

in tunnel of *Diatraea saccharalis* Fabr. in sugar cane at Yabucoa (65-13 det. Wheeler).

**Tetramorium (Tetrogus) simillimum** F. Smith

Wheeler: under stones and logs on the beach of Culebra Id., and in the creek bottom at Coamo Springs.

entering small holes in the buds of sugar cane (152-20 det. Mann).

**Wasmannia auropunctata** Roger

Wheeler: "common — under stones, prostrate plantain trunks or logs in shady places," on Culebra Id., and at many points in Porto Rico. Illustration of worker.

Van Dine 13-30: attending *Pseudococcus sacchari* Ckll. on sugar cane.

Van Dine 13-33; Jones 15b-15: attending *Sipha flava* Forbes on sugar cane. Colón 19-30: mention. Van Z. (P. R. 321).

Wetmore 16-75, 87, 101, 108: eaten by Swift, Swallow, Oven-Bird and Parula Warbler.

Van Zwaluwenburg 17a-515: reported to occasionally kill out and displace colonies of "hormiguilla" in coffee groves.

attending *Pseudococcus sacchari* Ckll. on sugar cane (181-11, 205-11, 596-12); attending *Pseudococcus citri* Risso on coffee at Ciales (600-21) attending *Sipha flava* Forbes on sugar cane (331-12); on coffee at Yabucoa (606-22), at Quebradillas (616-22), known in coffee groves as "*albayaide*."

**Strumigenys rogeri** Emery

Wheeler: under stones in stream bed at Coamo Springs. Illustration of worker.

Wetmore 16-119: eaten by Mozambique.

**Strumigenys louisianae** Roger, var. **obscuriventris** Wheeler 08-145, TYPE from Coamo Springs, Porto Rico, colonies in dry stream bed. Illustration of worker.

Wheeler 10-132: same illustration.

**Atta (Trachymyrmex) jamaicensis** Ern. Andre

Wheeler: from Culebra Id., and reference to —.

Wheeler, Wm. M., "The Fungus-growing Ants of North America," Bull. Amer. Mus. Nat. Hist., Vol. 23, No. ----, pp. 669-807, pl. xlix-liii, fig. 31, 1907.

**Atta (Mycocepurus) smithi** Forel, var. **borinquenensis** Wheeler 07- ----, TYPE from Porto Rico.

Wheeler: from many points in Porto Rico.

Wheeler 10-320: Illustration.

**Cyphomyrmex rimosus** Spinola **minutus** Mayr

Wheeler 07- ----: Wheeler 10-319: Illustration.

Wheeler: from Culebra Id., and many points in Porto Rico.

Wetmore 16-101: eaten by Oven-Bird.

(615-22), nesting under cow dung (269-12); under rotten log of *Erythrina glauca* at Cayey (617-22).

**Myrmicocrypta brittoni** Wheeler 07- ----, TYPE from Porto Rico.

Wheeler: at Santurce. Wheeler 10-318: Illustration.

## DOLICHODERINAE.

**Tapinoma melanocephalum** Fabr.

Wheeler: "nesting under stones and under the bark of trees" at many places in Porto Rico, and on Culebra Id.

attacking live insects (110-21), carrying off dead insects (456-12); nesting under board on ground (163-13).

**Tapinoma littorale** Wheeler

Wheeler: "in hollow twigs of trees and bushes" at Monte Morales and Monte Mandios.

**Dorymyrmex pyramicus** Roger, var. **niger** Pergande

Wheeler: "common in sandy and sunny places" in Porto Rico, but not in Culebra Id.

**Iridomyrmex melleus** Wheeler 08-151, TYPE from mountains of Porto Rico. Common in mountains, arboreal, nesting in hollow twigs, or building "carton" nests at base of leaves of "ortegón", *Coccoloba rugosa*, at Utuado, which are not aphid sheds. Illustrations of workers and "carton" nests.

Wheeler 10-223: construction of "carton" nests.

Wolecott 23-57: on coffee.

on coffee trees, nesting in hollow twigs, or in bark in crotch, or between crossing limbs, and often building "carton" nests over colonies, at Guayama (605-21), at Corozal (606-21), at Adjuntas (607-21, 608-21), and in cocoon of *Megalopyge kru-gii* Dewitz (610-21), at Aibonito (611-21).

**Iridomyrmex melleus** var. **fuscescens** Wheeler 08-153, TYPE of variety from Monte Morales and Monte Mandios, Porto Rico, at the summits of the mountains.

on cotton at Boquerón (601-23 det. More).



## CAMPONITINAE.

**Brachymyrmex heeri** Forel

Wheeler: "small colonies under stones" at Santurce and Utuado, and on Culebra Id.

Van Z. (P. R. 153).

**Brachymyrmex heeri** var. **obscurior** Forel

Wheeler: at Santurce.

Van Dine 13a-32; Jones 15b-15: attending *Sipha flava* Forbes on sugar cane. Colón 19-30: same data.

Van Z. (P. R. 317).

attending *Sipha flava* Forbes on sugar cane (332-12).

**Prenolepis longicornis** Latreille

Wheeler: "very common in houses, gardens and fields" in Porto Rico and on Vieques Id.

Jones 15-10: digging up lettuce seeds.

in house (134-11); on *Inga vera* at Yauco (610-22); carrying tobacco seed from seed beds at Caguas (25-10); nesting at base of coconut palm fronds on the beach at Mameyes, attending mealybugs and *Orthezia insignis* Douglas on *Lantana camara* (335-22).

**Prenolepis vividula** Nylander

Wheeler: from Culebra Id., Utuado and mountains of Porto Rico.

on coffee at Utuado (155-20), on *Inga vera* at Utuado (156-20); on banana, nesting in stem, at Maricao (157-20 det. Mann).

**Prenolepis steinheili** Forel

Wheeler: at Adjuntas and Santurce.

**Prenolepis fulva** Mayr

Van Z. (P. R. 1021).

attending *Pseudococcus sacchari* Ckll. on sugar cane at Humacao (57-10 det. Wheeler).

**Myrmelachista ambigua** Forel, subsp. **ramulorum** Wheeler 08-155, TYPE from Arecibo and Utuado, Porto Rico, and Culebra Id., in hollow twigs of sea-grape, *Coccoloba uvifera*, and "torchuelo", *Bucida buceros*. Illustrations of worker. the "hormiguilla" of coffee groves in Porto Rico.

McClelland, T. B., "Report of the Assistant Horticulturist" in Ann. Rept. P. R. Agr. Expt. Station at Mayagüez, 1911, p. 30, Washington, D. C., Sept. 3, 1912: in three months driven from coffee when old infested shade trees, *Inga laurina*, are cut down.

Hooker 13-34; on guama and coffee trees, feeding on honey dew from a mealybug, *Pseudococcus citri* Risso, and a large fleshy, pink scale of the sub-family Coccinae. Injury and unsuccessful control measures.

- Van Zwaluwenburg 15-33: unsuccessful methods of control.  
 McClelland, T. B., "Report of the Assistant Horticulturist" in Ann. Rpt. P. R. Agr. Expt. Station at Mayagüez, 1913, p. 23. Washington, D. C., May 28, 1914: control by pruning young growth of coffee shade trees, *Inga laurina*, and banding with tree tanglefoot.  
 Van Zwaluwenburg 16-42: desirable coffee shade trees, not attractive to the "hormiguilla" not found.  
 Van Zwaluwenburg 17-515: the most complete and extended account of the "hormiguilla" as a pest of coffee.  
 Van Z. (601) attending undetermined pink *Coccus* in twigs of *Inga laurina*.  
 Wetmore 16-63: eaten by Woodpecker.  
 Wolcott 21-48: notes.  
 Ferris, G. F., "Notes on Coccidae. IX. (Hemiptera)" in Canadian Entomologist, Vol. 54, No. 7, July, 1922, p. 160: description of the coccid, attended by the "hormiguilla," as *Cryptostigma ingae*.  
 Wolcott 23-58: host trees: attending *Cryptostigma ingae* Ferris and preliminary experiments in control with poisoned bait. nesting in sea-grape, *Coccoloba uvifera*, attending a mealybug at Loíza (607-22); nesting in twin tree of *Ficus laevigata* in Ciales valley south of Manatí (621-22); on coffee, guava, *Inga vera*, and guama, *Inga laurina*, throughout the coffee districts, at Utuado (153-20), at Lares (154-20), at Yauco (396-21), at Cayey (618-22).

### **Camponotus ustus** Forel

- Wheeler: "in the hollow twigs of sea-grape, *Coccoloba uvifera*," at San Juan and Utuado, in Culebra Id., "nesting in the ground under a block of beach-worn coral."  
 Wetmore 16-63: eaten by Woodpecker.  
 in old stump at Utuado (159-20), at San Sebastián (115-21); in dead twigs of *Inga vera* at Utuado (158-20), at Ciales (600-23); in coffee at Lares (640-21).

### **Camponotus sexguttatus** Fabr.

- Wheeler: on Culebra Id., in twigs of sea-grape, illustration. At San Juan, and Fajardo (Busck), on flowers of *Serjeania lucida* at Coamo.

### **Camponotus cuneiscapus** Emery

- Van Z. (P. R. 620).

## **SERPHOIDEA.**

## **SCELIONIDÆ.**

### **Prophanurus alecto** Crawford—det. Gahan

- Wolcott 22e-24: a parasite of the eggs of *Diatraea saccharalis* Fabr., notes, a short description and illustration of adult.  
 from eggs of *Diatraea saccharalis* Fabr. (234-21), at Toa Baja (336-21).

**Phanurus flavus**, Dodd, Alan P., "A New Proctotrypoid Egg-parasite from the West Indies (Hym.)" in *Entomological News*, Vol. 25, p. 350, October, 1914, TYPE from Porto Rico.

from eggs of *Ormenis pygmaea* Fabr. 360-12 TYPE), a common parasite.

**Telenomus monilicornis** Ashmead

Tower 08-35; Tower 10-27; Wolcott 22c-8: from eggs of *Phlegethontius sexta* Johan.

## CHALCIDOIDEA.

### CHALCIDIDÆ.

**Chalcis incerta** Cresson

(as *C. annulata* Fabr.) Barrett 06-23: from pupae of *Alabama argillacea* Hübner.

Gundlach (det. Cresson).

(as sp.) Wetmore 16-89: eaten by Martin.

Van Z. (5020) from pupae of *Pieris monuste* Linn. and *Megalopyge krugii* Dewitz. (additional records from Mayagüez Station specimens in the National Museum supplied by Mr. Rohwer: from *Calpodes ethlius* Cramer and *Aletia* (*Alabama*) *argillacea* Hübner (O. W. Barrett) det. Crawford.)

adult swept from grass (79-12); reared from *Mesoncondyla concordalis* Hübner (693-17); from chrysalis of *Eantis thraso* Hübner at Lares (406-22); from pupae of *Alabama argillacea* Hübner at Camuy (208-22), at Boquerón (24-23), in the latter case, of a large number of pupae collected, all were parasitized, and this parasite was undoubtedly responsible for checking the extensive outbreak.

(**Chalcis restituta** Walker

Gundlach: "con duda" det. Cresson.)

**Chalcis robusta** Cresson

Gundlach: "de los contornos de Mayagüez." Ashmead.

one specimen reared from *Mocis repanda* Fabr. at Boquerón (341-23).

**Chalcis robustella** sp. nov.

(as *C. near robusta* Cresson) Jones & Wolcott 22-49: from *Remigia repanda* Fabr.

Differs from *C. robusta* Cresson in having basal portion of femora black and posterior femora all black except outside and anterior distal quarter, and a small dim spot of yellow at the base.

Black, robust, clothed with short golden-yellow pubescence. Head as broad as prothorax, densely and deeply punctured, with a deep depression in the middle of the face for the reception of the polished and pubescent scape of the antennae, the flagellum robust, dull, greyish, somewhat tapering at ends and slightly constricted at joints. Ocelli reddish-brown. Tho-

rax densely and somewhat more coarsely punctate, pronotum margined vertically at anterior lateral angles. Scutellum produced behind, densely pubescent at tip and at sides near base. Tegulae bright yellow, wings subhyaline.

Anterior femora except at base, most of median femora except for an elongate black area at base extending on upper side one-half to two-thirds the distance to the apex, tibiae, except for base of posterior pair, and tarsi except claws and two final segments of posterior pair, bright yellow. Posterior femora much swollen and all black except for a bright yellow spot on outside and anterior distal quarter, and a small dull yellow spot at base, posterior margin armed with ten or eleven obtuse teeth, largest at base, smaller and more thick-set towards apex. Abdomen subsessile, robust, convex, flattened beneath, ovate, bluntly pointed at tip, smoothly polished and with posterior margins of apical segments faintly punctate and more or less fringed with golden and silvery pubescence. Length 6.5—8 mm.

from cocoons of *Megalopyge krugii* Dewitz (38-21 TYPE); from pupae of *Remigia repanda* Fabr. at Guánica (656-14, the yellow spot on posterior femora of these specimens extends over half way towards the base on the anterior margins, also to the apex, and the tibiae are all yellow); from *Neonympha* pupa at Guánica, parasitized July 25, 1:42 PM, adult issued Aug. 6, 4:00 PM (E. G. Smyth), (approaching *C. incerta* Cresson, with silvery pubescence and small areas of black appearing on the tibiae, but the yellow areas are bright and intense); resting on *Conocarpus erectus* at Arecibo (361-23).

### ***Spilochalcis femorata* Fabr.**

Van Z. (P. R. 49). (as sp.) Wetmore 16-61: eaten by Ani.

swept from grass at Morovis (GNW), from carrots (549-17, 691-17), on corn at Guánica (431-14); reared from *Pachyzancla bipunctalis* Fabr. (655-16).

### ***Spilochalcis syrphidis* sp. nov.**

Yellowish-ferrugineous. Antennae inserted in middle of face, scape slender and a little longer than the height of the head, funicle about twice as long, darker, faintly pubescent and of uniform thickness. Head wrinkled and shagreened, faintly pubescent, concave behind, eyes prominent, olive brown, ocelli large, prominent, shining, reddish-brown. Thorax shagreened. Pronotum lighter yellow, narrow dorsally and margined posteriorly with black, becoming somewhat wider towards the sides and unmargined. Mesothorax with a piceous longitudinal medio-dorsal line, often extending to the middle of the scutellum, and more or less piceous or black laterally and ventrally, between and in front of insertion of the legs, the anterior margin of the episternum always piceous or black, contrasting sharply with the light-yellow anterior and median pair of legs. Pos-

terior coxae shining, finely pitted on the outside, almost as large as the much-swollen and more pubescent femora, which on the distal two-thirds of their lower margins bear over 20 small black blunt teeth, the first largest, the others sub-equal in size, except the somewhat smaller and more closely-set apical five or six. Wings brilliantly hyaline. Petiole of abdomen, light-yellow and slender, with a foliate collar distad of the narrow constriction at base. Abdomen ovate, bluntly pointed at ends, shining, distal margins of its segments sparsely cilliate.

from puparia of Syrphid flies, *Toxomerus polygonastyla* Metcalf MS, on tobacco at Caguas (121-21 TYPE), swept from carrots (690-17).

### ***Spilochalcis cocois* sp. nov.**

Yellowish-green (in faded specimens dark reddish), pubescent and coarsely pitted on head and thorax. Head, with eyes each as wide as front, black around insertion of antennae, behind scape to ocelli, and posteriorly; insertion of antennae below middle, scape yellow, flagellum black, pubescent, of uniform width throughout. The segments of the thorax above more or less margined with black and their more elevated portions tending to be piceous or black, especially the scutum, which has a broad, median, longitudinal oval band; beneath black, except for spots on the metapleurum and epimerum with long pubescence; the propodeum with several large, deep, irregularly-polygonal craters, a short tooth, dorso-lateral of the pedicel, at one point on their margins. Pedicel light yellow, short, only as long as from insertion to scutellum; abdomen large, smooth, shining, oval, scantily pubescent, blunt at base, with an elongate, pointed tip recessed beneath posteriorly, black at base, on posterior margins dorsally of other segments and on entire posterior quarter except for a semi-circular spot dorsally on the sixth segment. Posterior coxae finely reticulate and with a large black spot on the flattened surface where the femora fold against them, elsewhere pubescent; femora black at base and apex and with a spot on upper margin, dilated and with 15-16 small, black teeth on lower margin, the more basal one not much larger than the others; tibiae black at base and with a round black spot on middle, lighter yellow than the femora, but not quite as light as tarsi, the apical spur, long, curved and sharply-pointed two-thirds as long as tarsi. Wings, clear, hyaline, venation brown, yellow at base. Length 4 mm.

from coconut palm leaves infested with *Homaledra sabulella* Chambers (106-23).

### ***Spilochalcis homledrae* sp. nov.**

Black, head and thorax roughly and shallowly pitted, the pits on scutellum and metapleura larger and shallower, with whitish pubescence. Head beneath, about half-way up behind eyes and

in front along their margins nearly to top, light yellowish-green, but much darker in old specimens; insertion of antennae low, scape largely or entirely light yellow, flagellum as long as height of head, black, densely pubescent, slightly narrower towards base. Pronotum dorsally, sides of scutellum, pedicel of abdomen, anterior and median pairs of legs and posterior tarsi light yellowish-green, becoming browner in old specimens. Below the base of the pedicel, a pair of large, sharp teeth, deeply hollowed out beneath and laterally. Pedicel as long as scutellum, about half as long as abdomen; abdomen shining, faintly pubescent, more taperingly pointed at apex. Posterior coxae faintly crenulate, shining, scantily pubescent; femora black or piceous, densely pubescent, a small yellow spot near the apex on the outside and an elongate band along upper margin, the large basal tooth on ventral margin reddish-brown, the twelve other smaller teeth black, from the fifth tooth to the apex with rather long white hairs extending beyond them from the inner surface of the femur; tibiae light yellow near base and at apex, black at base and middle, strongly curved and produced into a sharp tooth. Wings transparent, hyaline, venation brown, yellow at base. Length about 3 mm.

from coconut palm leaves infested with *Homaledra sabulella* Chambers (137-23).

***Smiera cressoni* Howard—det. Gahan**

from pupa of *Oxyptilus* sp. on *Caperonia regalis* (588-12).

***Smiera emarginata* Fabr.**

Gundlach, "rara." Ashmead. Dewitz.

***Smiera* (*Tetrasmiera*) *eubule* Cresson**

Van Z. (P. R. 59).

from pupa of *Callydrias eubule* Linn. (160-12), at Guánica (202A-15). (160-12) differs from Cresson's description in that all markings on thorax and legs are black, and in addition has a black petiole to the abdomen, but (202A-15) has some of its markings ferruginous and the petiole is yellow, and as they are from the host recorded by Cresson, probably represent a more melanic variation of the Cuban species.

***Smiera flavopicta* Cresson**

Gundlach, "común." Ashmead. Dewitz.

***Smiera ignea* Cresson**

Gundlach, "rara." Ashmead. Dewitz.

***Smiera punctata* Fabr.**

Gundlach, "Las larvas de todas las especies de esta familia se crían dentro del cuerpo de orugas y larvas, o crysálidas y ninfas."

Dewitz.



## PERILAMPIDÆ.

**Perilampidea larium** sp. nov.

Head, blue-black, iridescent, pitted and covered with short white hairs, thorax blue becoming purplish and greatly expanded between the wings, abdomen small and bright iridescent green, legs light-yellow. Wings transparent, pinkish iridescent.

from pupa of *Baccha clavata* Fabr. at Lares (428-21, TYPE in National Museum.)

## EURYTOMIDÆ.

**Eurytoma ctenodactylomyii** Girault, A. A., Ins. Insc. Menstruus, Vol. 4, 1916, p. 111: from galls in sea-grape, *Coccoloba uvifera*, of *Ctenodactylomyia watsoni* Felt, TYPE from Porto Rico.

## EUPELMIDÆ.

**Lecaniobius cockerellii** Ashmead

Ashmead 00-341:

**Tanaostigmodes portoricensis** Crawford 13-247, TYPE from Porto Rico.

Van Z. (P. R. 1623) from seed pods of *Inga laurina*.

## ENCYRTIDÆ.

**Hunterellus hookeri** Howard—det. Crawford

from tick, *Dermacentor nitens* Neuman (358-12); running about in hairs of dog (707-13).

**Arrhenophagus chionaspidis** Aurivillius—det. Girault

Jones 17-8, 11: from *Hemichionaspis minor* Maskell and *Saissetia nigra* Nientn. (321-12).

**Coccidoxenus portoricensis** Crawford 13-249, TYPE from Porto Rico.

Jones 17-2: from *Ceroplastes cistudiformis* Comst.

**Habrolepoidea celia** Girault, A. A., TYPE from Porto Rico.

from puparium of syrphid fly, *Baccha latiuscula* Loew (143-17), at Pt. Cangrejos (GNW).

## APHELINIDÆ.

**Aspidiotiphagus citrinus** Crawford

Carnes, E. K., "Report of the Insectary Division for the Month of May, 1912," in Monthly Bull. State Comm. Hort., Sacramento, California, Vol. 1, No. 8, 1912, pp. 395-400: "From Prof. C. W. Hooker, Mayagüez, Porto Rico. First shipment: *Lepidosaphes beckii*, *Chrysomphalus aonidium*. *Aspidiotiphagus citrinus* issued in considerable numbers. Second shipment: same material. Very few *A. citrinus* issued."

Jones 17-9: from *Chionaspis citri* Comst.

**Aphelinus chrysomphali** Mercet—det. Gahan

Jones 17-11: from *Aspidiotus destructor* Sign., det. Dr. Howard as "apparently my *Aphelinus diaspidis*."

from *Aspidiotus destructor* Sign. (652-21) and adults abundant on infested coconut leaves.

**Encarsia portoricensis** Howard, L. O., 07-77: "from *Aleyrodes* sp. on a climbing vine, Bayamón, Porto Rico, reared by Mr. A. Busck," TYPE from Porto Rico.

Van Z. (5022) from *Aleyrodes* sp.

**Perrisopterus busckii** Howard, L. O., "New Genera and Species of Aphelininae," U. S. Dept. Agr., Bur. Ent., Technical Series, No. 12, pt. 4, July 12, 1907, p. 87: "from *Asterolecanium aureum* Boisduval, collected at San Juan, Porto Rico, Feb. 21, 1899, by A. Busck," TYPE from Porto Rico.

## SPALANGIDÆ.

**Spalangia** sp.—det. Crawford

Wolcott 22d-18: reared from horn-fly pupae at Guánica by G. B. Merrill.

## PTEROMALIDÆ.

**Neocatolaccus filia** Girault, A. A. (MS name)

from pupa of *Agromyza caerulea* Malloch in seeds of morning glory (142-17).

**Neocatolaccus** near **filia**—det. Girault

from pupae of *Agromyzid* fly in seeds of *Sida rhombifolia* at Mayagüez (242-17).

**Neocatolaccus livii** Girault, A. A., Ins. Insc. Menstruus, Vol. 4, 1916, p. 111; reared from galls in sea-grape, *Coccoloba uvifera*, of *Utenodayctylomia watsoni* Felt, TYPE from Porto Rico.**Pteromalus calandreae** Howard

Barrett 05-396: "a common parasite of the rice weevil, *Calandra oryzae*."

## EULOPHIDÆ.

## ELACHERTINAE.

**Ardalus antillarum** Gahan, A. B., Proc. U. S. National Museum, Vol. 61, Art. 24, No. 2445, p. 20, 1922: "from larvae of *Prenes nero* Fabricius, May 10, 1921", TYPE from Caguas, Porto Rico.

Jones & Wolcott 22-41: "The larvae—issue from the caterpillars and form naked black pupae nearby, sixteen individuals having been observed to come from one large larva."

(10-13) from larva of *Prenes nero* Fabr.

**Euplectrus** sp.—det. Gahan

Wolcott 21-38: on larva of *Laphygma frugiperda* S. & A.

Jones & Wolcott 22-44: on *Cirphis latiuscula* Herr. Sch.

on larvae of *Cirphis latiuscula* H. S. (23-13, 39-13), of *Xylomiges sunia* Guenee (576-17), of *Autographa rogationis* Guenee (303-16).

**Zagrammosoma multilineata** Ashmead—det. Ashmead

Barrett 06-22: a "rare parasite, strictly primary" of *Leucoptera coffeella* Stainton, the coffee leaf-miner.

Van Zwaluwenburg 15-33; Van Zwaluwenburg 17-514: mention.

Wolcott 21a-8: illustration of adult, notes.

**Zagrammosoma** sp.—det. Gahan

with two dorso-lateral black stripes on the thorax, the more dorsal becoming broader on the abdomen, the other fainter and interrupted.

from mines of *Leucoptera coffeella* Stainton on coffee at Lares (152-21).

## EULOPHINAE.

**Diaulinus insularis** Gahan, A. B., Proc. U. S. National Museum, Vol. 48, Dec. 16, 1914, p. 165: from *Agromyza inaequalis* Malloch, TYPE from Porto Rico.

## ENTEDONTINAE.

**Chrysocharis livida** Cresson

Barrett 05-397: a parasite of *Leucoptera coffeella* Stainton, the coffee leaf-miner, at Mayagüez. "black with purplish reflections from the thorax; the size about 1 mm.: it is very active."

Barrett 06-22: "throughout the island."

Van Zwaluwenburg 15-33: 30% of the pupae of *L. coffeella* parasitized at Mayagüez.

Van Zwaluwenburg 17-514: mention.

Wolcott 21a-8: illustration of adult, notes.

**Horismenus pteromalis**

Van Z. (5024) from undetermined sphingid.

**Horismenus** sp.—det. Crawford

from seed pods of *Acacia farnesiana* infested with *Bruchus* sp. at Guánica (43-14), from pods of *Prosopis juliflora* (45-14).

## TETRASTICHINAE.

**Tetrastichus hagenowi** Ratz.—det. Crawford

Sein 23-5: as a primary parasite of *Periplaneta americana* Linn. egg masses, notes.

71 individuals from one egg capsule (409-12, 333-22 det. Gahan).

**Tetrastichus periplanetae** Crawford—det. Gahan  
from egg capsule of cockroach (343-21).

**Tetrastichus vaquitarum** sp. nov.

Head yellow, piceous behind, eyes and ocelli chestnut red, antennae dark yellow, with many long yellow hairs. Thorax shining blue-black, mesonotum with median longitudinal sulcus, very distinct and the scutellum divided into approximately three equal parts by two such longitudinal impressed lines. Abdomen flattened dorso-ventrally, prolonged to an acute tip, yellow, except the three post-median segments dorsally which are piceous. Legs light yellow with tips of tarsi black, wings hyaline and pinkish iridescent, with many short hairs, veins very light brown. Length 1 mm.

from eggs of *Lachnopus coffeae* Marshall in the mountains north of Yauco (153-21 TYPE).

Van Zwaluwenburg 17-515: "A Chalcid has been bred from what appeared to be the egg cluster of this insect." (*Lachnopus coffeae* Marshall).

(as sp.—det. Gahan). Wolcott 22a-17: illustration of adult and notes.

#### TRICHOGRAMMIDÆ.

**Brachistella prima** Perkins—det. Girault  
from eggs of *Kolla similis* Walker on sugar cane (335-12).

**Ufens niger** Ashmead—det. Girault  
from eggs of *Kolla similis* Walker on sugar cane (335-12).

**Oligosita comosipennis** Girault—det. Girault  
from eggs of *Kolla similis* Walker on sugar cane (335-12).

**Aphelinoidea semifuscipennis** var. *albipes* Girault—det. Girault  
from eggs of *Liburnia* sp. on *Paspalum* sp. (126-12).

**Poropoea attelaborum** Girault—det. Gahan  
Wolcott 22a-7: mention.  
from eggs of *Attelabus sexmaculatus* Chevrolat (GNW).

**Trichogramma minutum** Riley—det. Girault  
Van Dine 13-29; Van Dine 13-254; Colón 19-42; Smyth 19-144:  
from eggs of *Diatraea saccharalis* Fabr.

Wolcott 15-2: less abundant in cane fields where trash has been burned as indicated by higher infestation of cane by *Diatraea saccharalis* Fabr.

Jones 15c-14: notes and illustration of parasitized eggs.

Wolcott 22e-24: notes, short description and illustration of adult.

Jones & Wolcott 22-41: from eggs of *Prenes nero* Fabr.

Jones & Wolcott 22-42: from eggs of *Prenes ares* Felder.

Van Z. (5088) from eggs of *Diatraea saccharalis* Fabr.

from eggs of *Diatraea saccharalis* Fabr. at Guánica (112-11, 506-12, 172-13); from eggs of *Prenes ares* Felder (1222-13), of *Pachyzancla periusalis* Walker (624-17, 546-17); on canna leaves, parasiting eggs of *Calpodes ethlius* Cramer at Pt. Cangrejos (190-15).

## MYMARIDÆ.

**Anagrus armatus** Ashmead—det. Girault

Jones 14-463: from eggs of *Delphax saccharivora* Westw.

from eggs of *Saccharosydne saccharivora* Westw. on sugar cane (208-11), from eggs of *Liburnia* sp. on *Paspalum* sp. (126-12).

## CYNIPOIDEA.

## 'FIGITIDÆ.

**Ganaspis hookeri** Crawford 13-244, TYPE from Porto Rico.

(as sp.) Hooker 13-36: attacking the larvae of *Anastrepha fraterculus* Wied. in fruit of *Spondias lutea*.

**Xyalosema (Aspicera) bifoveolata** Cresson—det. Crawford

Wolcott 22d-18: from horn-fly pupae at Guánica (G. B. Merrill).

## ICHNEUMONOIDEA.

## ICHNEUMONIDÆ.

(The generic transfers in this family were made by Mr. R. A. Cushman.)

**Tetragonochlora meridionalis** Cresson

(as *Ichneumon*) Stahl.

**Acroricnus cubensis** Cresson—det. Cushman

reared from nest of *Eumenes ornatus* Saussure (290-23).

**Hemiteles subflavescens** Cresson

Stahl.

**Lissonota** sp.—det. Cushman

from *Agathodes designalis* Guenee (409-22).

**Christolimorpha incertus** Cresson

(as *Hemiteles*) Gundlach. Aldrich.

a male from Morovis (GNW) is apparently this species, a female from Ciales (GNW) similar, but has only "posteriorly a small white spot, elevated into a subacute tubercle" of *H. amoenus* Cr., not the "long, porrect, acute spine" of *H. incertus* Cr., and in other ways, more or less combines characters of the two species.

**Christolimorpha plesius** Viereck 13-564, TYPE from Porto Rico.**Ephialtes marginella** Brulle

(as *Pimpla*) Stahl. Gundlach. Ashmead.

**Tromatobia (Ephialtes) cressoni** Dewitz 81-205, TYPE from Mayagüez, Porto Rico.

(as *Ephialtes*) Gundlach.

14 males and 2 females from a cluster of spider eggs at Lares (324-21 det. Cushman), 1 female in coffee grove (49-21).

**Theronia bicincta** Cresson

(as *Pimpla*) Stahl.

**Theronia (Pimpla) nubecularia** Dewitz 81-206, TYPE from Mayagüez, Porto Rico.

(as *Pimpla*) Gundlach.

**Eremotylus angulatus** Hooker 12- , TYPE from Porto Rico.

Van Z. (5037) from larva of *Ecpantheria cridanus* Cramer.

Van Zwaluwenburg, R. H., Ins. Insc. Menstruus, Vol. 4, 1916, p. 17: same data.

**Tryphon cerberus** Dewitz 81-206, TYPE from Porto Rico. Gundlach.

**Enicospilus arcuatus** Felt—det. Cushman  
from Aibonito (SSC).

**Enicospilus concolor** Cresson

Van Z. (P. R. 1028).

abundant in grass (415-17 det. Cushman).

**Enicospilus flavus** Fabr.

(as *Ophion*) Stahl. Gundlach, "común."

Van Z. (P. R. 1027).

**Enicospilus purgatus** Say

Van Z. (P. R. 1029).

**Enicospilus thoracicus** Cresson

(as *Ophion*) Gundlach.

Van Z. (5083) from *Phlegethontius sexta* Johan.

Wolcott 22c-8: same data.

**Ophion bilineatus** Say

Hooker 12-45:

from Guánica (GBM).

**Ophion biangularis** Taschenberg

Van Z. (P. R. 1026).

**(Ophion bicarinatus** Cresson MS TYPE from Mayagüez, Porto Rico. Gundlach.)

**(Ophion obsoletus** Cresson MS TYPE from Porto Rico. Gundlach.)

**Ophiopterus ferrugineus** Cresson

Hooker 12-176, b & c:



**Eiphosoma annulata** Cresson

Dewitz. Stahl. Gundlach, "en Utuado." Ashmead.  
swept from weeds (139-17), from carrots (692-17 det.  
Cushman); from cane at Guánica (102-13, 430-14); "reared  
from leaf-roller larva." E. G. Smyth.

**Eiphosoma (Brachixiphosoma) insularis** Viereck 13-564, TYPE  
from Porto Rico.

**Eiphosoma nigrovittata** Cresson

Dewitz. Gundlach. Ashmead.  
swept from carrots (692-17), and unlabeled specimen.

**Eiphosoma vitticollis** Cresson

from Guánica (444-14 det. GNW).

## EVANIIDÆ.

**Evania appendigaster** Linn.

(as *E. laevigata* Oliv.) Dewitz. Gundlach, "Se encuentra mu-  
chas veces en las casas, donde la larva se cría en las oötecas  
de las cucarachas."

Seín 23-5: notes and illustration of adult.

from eggs of cockroaches (168-15), at Arecibo (445-13), at  
Guánica (445-14).

**Evania ruficaput** Dewitz 81-205, TYPE from Mayagüez, Porto Rico.  
Gundlach.

**Hyptia petifolia** Fabr.

Dewitz. Gundlach. Ashmead.

**Hyptia rufipectus** Dewitz 81-205, TYPE from Mayagüez, Porto Rico.  
Gundlach.

## BRACONIDÆ.

**Rogas** sp. nov.—det. Gahan

Jones & Wolcott 22-49: from *Remigia repanda* Fabr.  
at Guánica (429-13).

**Homalotylus obscurus**

Jones 156-12: parasitic on *Cycloneda sanguinea* Linn. and *Me-  
gilla innotata* Vauls.

**Aphidius (Lysiphlebus) testaceipes** Cresson

Jones 14-462, Jones 15b-17: as parasite of *Aphis setariae* Thos.  
Colón 19-30: same data.

Wolcott 22-5: illustration of parasitism of *Toxoptera aurantiae*  
Boyer on grapefruit.

parasitic on aphids, *Hysteroneura setariae* Thos. on sugar  
cane (93-13 det. Gahan), *Aphis gossypii* Glover on cucumber  
(42-12 — det. Viereck), *Toxoptera aurantiae* Boyer on grape-  
fruit (GNW).

**Chelonus insularis** Cresson

Dewitz. Gundlach. Van Z. (P. R. 61).

Jones & Wolcott 22-47: "The female ---, after removing a portion of the hairs from the egg cluster (of *Laphygma frugiperda* S. & A.) lays its eggs in the eggs of the moth. Caterpillars from these eggs issue normally, but they contain the maggots of the wasp which kill them before they are more than half-grown. The small caterpillars enter the ground as if to pupate, but soon die, and the cocoons of the parasite will be found within the shriveled remains of the host caterpillar."

adults swept from weeds (27-17), on corn at Aguadilla (26-22); parasitizing eggs of *Laphygma frugiperda* S. & A. at Guánica (91-13); reared from larvae of *Heliothis obsoleta* Fabr. at Caguas (139-11).

**Monogonogaster ventralis** Cresson

(as *Bracon*) Gundlach. Dewitz.

Van Z. (P. R. 50).

**Yelicones** sp.—det. Rohwer

from *Tetralopha scabridella* Ragonot on *Inga vera* at Cayey (12-23).

**Iphiaulax voraginis** Cresson

(as *Bracon*) Gundlach, "en Quebradillas." Dewitz.

**Bracon guanicana** sp. nov.

Length 6 mm., of ovipositor 3 mm. additional. Shining yellowish-brown, except antennae, veination, posterior tarsi and apical portion of posterior tibiae, and sheath to ovipositor, which are piceous to black. Abdomen above polished and scantily pubescent, rest of body, including ovipositor sheath, finely and densely pubescent, pubescence on the legs being especially dense and long.

Head, pear-shaped, narrowed beneath the eyes, concave below and medially of their lower margin on either side of broad median ridge, twice as high as the eyes and more than twice as broad as an eye between them; ocelli darker, reddish-brown, in slight craters on an elevation at the top of the head, in the male a transverse ridge cuts off the lateral pair from the craters around the insertions of the antennae and the median one, less well marked in the female. Basal joint of antennae reddish-brown, also the base of the much larger and shining second segment; flagellum dull, densely pubescent, its first segment longer than the second, second and third subequal. A median furrow on the mesonotum, the notauli meet behind its disappearance (making a heart-shaped elevation) and extend a short distance behind as a furrow; a pair of deep quadrangular depressions in front of the scutum; dorsal aspect of the propodeum not as shiny, with longitudinal ridges at

sides, a pair in the middle and another pair about midway between, posteriorly connected by several smaller and somewhat obscure transverse ridges. Abdomen brilliantly shining, about as long as thorax but considerably narrower, flattened above and sharply cut away from lateral margins, but more rounding and not margined posteriorly, apical segments darker, especially in the male, sharply bent downward just anterior of the rounded posterior margin of the first segment, which is nearly twice as long as broad at apex, the other segments progressively shorter, the third and fourth the broadest. Ovipositor slightly curved, yellow, covered, except near apex, by pubescent black sheath. Wings dusky, basal half lighter, veination blackish, base of median vein and of stigma lighter, areolet quadrangular, open on lower half of outside margin, directly under stigma.

One male and two females (three other specimens in National Museum) "collected in screen trap in garden" by E. G. Smyth at Guánica (457 — June 30, 1914), generic determination by Mr. Gahan.

**Crassomicrodus fenestratus** Viereck 13-559, TYPE from Porto Rico. at Guánica (453-14 det. Gahan).

**Microbracon** sp.—det. Crawford

Jones & Wolcott 22-42:

from larvae of *Prenes ares* Felder on sugar cane (1205-13), at Luquillo (188-13).

**Apanteles aletiae** Riley—det. Gahan

from small larva of *Alabama argillacea* Hübner at Hatillo (330-22).

**Apanteles leucostigmus** Ashmead—det. Gahan

from larva of *Eudamus proteus* Linn. (27-13), at Guánica (634-14).

**Apanteles prenidis** Muesebeck, C. F. W., "A Revision of the N. A. Species of Ichneumon-Flies belonging to the Genus *Apanteles*." Proc. U. S. National Museum, Vol. 58, No. 2349, pp. 483-576, 1920; TYPE from Luquillo, Porto Rico, (p. 558), reared from *Prenes ares* Felder.

Wolcott 21-39: from *Prenes nero* Fabr.

Jones & Wolcott 22-41 & 42: from *Prenes nero* Fabr. & *P. ares* Felder.

from larva of *Prenes ares* Felder at Luquillo (186-13 TYPE); from *Prenes nero* Fabr. (GNW — det. Muesebeck).

**Apanteles marginiventris** Cresson = **Apanteles grenadensis** Ashmead — det. Gahan.

Jones & Wolcott 22-44 & 47: from *Cirphis latiuscula* H. S. and *Laphygma frugiperda* S. & A.

from *Laphygma frugiperda* S. & A. at Garrochales (GNW).

**Apanteles flaviventris** Cresson

(as *Protopanteles*) Van Z. (5023) from *Dilophonota ello* Linn.  
from sphinx caterpillar, *Erinnyis ello* Linn. (396-12), at  
Guánica (200-15, 222-15, 372-15).

**Apanteles mayaguezensis** Viereck 13-563, TYPE from Mayagüez,  
Porto Rico.

Van Z. (5095).

from sphinx caterpillar on *Cissus sicyoides* (123-21 — det.  
Gahan).

**Apanteles congregatus** Say—det. Gahan

from larva of *Protambulyx strigilis* Linn. (22-19).

**Opius (Uteles) anastrephae** Viereck 13-564, TYPE from Mayagüez,  
Porto Rico.

Hooker 13-36: attacking larvae of *Anastrepha fraterculus* Wied.  
in fruit of jobo, *Spondias lutea*. Van Z. (5063).

**Opius insularis** Ashmead—det. Gahan

from *Agromyza* sp. on *Hyptis pectinata* (1123-16).

## ALYSIIDÆ.

**Alysia analis** Cresson—det. Gahan

in cane fields (80-13, 90-13), at Arecibo (15-15), at Guá-  
nica (41-22); in coffee groves at Cayey (371-21), at Ciales  
(78-22), being caught and killed by *Zelus longipes* Linn. in  
mountains north of Yauco (44-23).

## TENTHREDINIDÆ.

**Schizocera zaddachi** Dewitz 81-207, TYPE from Porto Rico=**Schizocera krugii** Cresson, E. T., Trans. Amer. Ent. Soc., Vol. 8,  
1880, p. 54, TYPE from Porto Rico.

Gundlach. Ashmead; giving both names.

(as *Sterictiphora zaddachi*) Van Zwaluwenburg 18-28: an ex-  
tended account, larvae feeding on sea-grape, *Coccoloba uvi-  
fera*, and icaco, *Chrysobalanus icaco*.

on sea-grape on the beach at Santurce (35-13), at Hatillo  
(501-18, 297-22), at Arecibo (GNW).



## COLEOPTERA.

### LITERATURE.

- Chevrolat, Aug.** Bull. Ent. Soc. France, Tome VII, Ser. V, 1877, pp. VIII-X.
- Weise, J.,** "Beitrag zur Chrysomeliden und Coccinelliden Fauna von Puertorico." Archiv für Naturgeschichte, Vol. 51, Part. 1, pp. 144-168, pl. viii, 1885.
- Quedenfeldt, G.,** "Neue und seltnere Kafer von Portorico." Berliner Entomologische Zeitschrift, Vol. 30, Part. 1, pp. 119-128, 1886.
- Leng, C. W. & Mutchler, A. J.,** "A Preliminary List of the Coleoptera of the West Indies as Recorded to Jan. 1, 1914." Bulletin American Museum of Natural History, Vol. 33, Art. 30, pp. 391-493, New York, Aug. 26, 1914.
- Leng, C. W. & Mutchler, A. J.,** "Supplement to Preliminary List of Coleoptera of the West Indies." Bulletin American Museum of Natural History, Vol. 37, Art. 5, pp. 191-220, New York, Feb. 13, 1917. (Only the original records in this paper are noted in the following list: those from the papers of Gundlach, Van Zwaluwenburg and Jones are omitted, except when listed in synonymy under a different name.)

Dr. E. A. Schwarz, of the U. S. National Museum, has made most of the determinations of Coleoptera on which the original records here given are based, and if determination by him is not always specified, it is usually implied. To him for aid in the preparation of this list, the writer is most greatly indebted. Dr. A. D. Hopkins, of the Bureau of Entomology, has determined the Platypoidae and the Scolytidae, Mr. W. S. Fisher the Buprestidae and some of the Cerambycidae, Mr. R. H. Van Zwaluwenburg the Elateridae, Mr. R. T. Cotton most of the beetles affecting stored grain, and, at the time he was connected with the Bureau, Dr. W. Dwight Pierce some of the Curculionidae. Dr. Pierce also described the only species of Strepsiptera recorded from Porto Rico.

Mr. Andrew J. Mutchler, of the American Museum of Natural



History, determined the Lampyridae and Cantharidae, and to him the writer is most grateful for references to literature not available in Porto Rico and for suggestions (not all of them adopted) regarding the format of the list. Dr. A. B. Wolcott, of the Field Museum at Chicago, described a Clerid from Porto Rico.

Dr. Guy A. K. Marshall, Director of the Imperial Bureau of Entomology, has determined many of the Curculionidae, and has described several new species from Porto Rico. To him the writer is also indebted for obtaining the determinations of several Chrysomelidae by Mr. G. E. Bryant, of Tenbrionidae by Mr. K. G. Blair and of *Lachnosterna* by Mr. E. S. Arrow.

## CICINDELIDÆ.

## LITERATURE.

- Leng, C. W. & Mutchler, A. J.,** "Descriptive Catalogue of West Indian Cicindelinae." Bulletin American Museum of Natural History, Vol. 35, Art. 36, pp. 681-699, pl. 1, figs. 5, New York, October 17, 1916: illustrations of four Porto Rican species and of alkali flat at Santa Rita (Guánica) where some of them were found.

- Tetracha sobrina** Dejean, var. **infuscata** Mannerheim  
(as *T. infuscata* Chaudoir) Stahl. Gundlach.  
Tower, W. V., in First Rpt. Bd. Comm. Agr. P. R., Jan. 1, 1912, p. 20: attacking the changa, *Scapteriscus vicinus* Scudder.  
**Leng & Mutchler.** Leng & Mutchler 16-686: notes.  
(747-12 det. Schwarz, 1028-16), at Caguas (SSC), at Guánica (-13), at Arecibo (150-16).

- Cicindela boops** Dejean  
Leng & Mutchler 16-691: short description and notes.  
at Guánica, December 1913 (EGS).

- Cicindela suturalis** Fabricius  
Leng & Mutchler 16-693: from Porto Rico.

- Cicindela suturalis** Fabr., var. **hebraea** Klug  
(as *C. hebraea* Klug) Stahl. Gundlach.  
Leng & Mutchler 16-694: description and notes, at Añasco.  
on the beach at Añasco, Sept. 2, 1914 (EGS).

- Cicindela trifasciata** Fabricius  
(as *C. tortuosa* Dejean) Stahl. Gundlach. Van Z. (P. R. 814).  
Leng & Mutchler 16-692: notes.  
at Guánica, July 1913 (EGS), at Arecibo (147-13), common on sandy banks of stream at Maunabo (658-17), on the beach at Pt. Cangrejos (GNW).

## CARABIDÆ.

**Calasoma alternans** Fabricius

Stahl. Gundlach. Leng &amp; Mutchler.

Van Z. (P. R. 5061) attacking *Remigia repanda* Fabr. and larvae of *Lachnosterna* spp.Wetmore 16-61: eaten by Ani, *Crotophagus ani*.Jones 13-235: probably predaceous on larvae of *Laphygma frugiperda* S. & A.

at light (88-21), at Arecibo (150-13), at Cayey (167-16), at Guánica (572-13, 451A-14), in land being plowed at Guánica (381-21).

**Scarites subterraneus** Fabricius

Stahl.

**Ardistomis mannerheimi** Putzeys

Leng &amp; Mutchler.

**Aspidiglossa vulnerata** Putzeys(as *A. bipustulata* Fabr.) Stahl. Gundlach.**Morio monilicornis** Latreille

Stahl. Gundlach. Leng &amp; Mutchler 17-195.

**Pangaeus fasciatus** Say

Gundlach.

**Pangaeus quadrisignatus** Chevrolat

Leng &amp; Mutchler 17-195.

at Aibonito (SSC), at Guánica (det. Schwarz).

**Pericompsus bladulus** Schaum

Leng &amp; Mutchler.

**Bembidium** sp.

Wetmore 16-43: eaten by Semipalmated Sandpiper.

**Tachys macrodentrus** Chevrolat

Gundlach.

**Tachys piceolus** Laferte

Leng &amp; Mutchler.

**Tachys vitiger** Leconte

Gundlach.

**Trechius substriatus** Chevrolat

Gundlach.

**Casnonia insignis** Chaudoir

Stahl. Gundlach.

**Lachnophorus leucopterus** Chevrolat

Leng &amp; Mutchler 17-194.

**Zuphium americanum** Dejean  
Gundlach.

**Lebia viridis** Say  
Leng & Mutchler 17-195.  
(252-12, 645-17)

**Lebia bitoeniata** Chevrolat  
Leng & Mutchler 17-195.

**Apenes marginalis** Dejean  
(as *Cymindis*) Gundlach, determined by M. Chevrolat.  
(195-12, 437-17), at Luquillo (203-13).

**Apenes varigata** Dejean  
Leng & Mutchler 17-195: recorded by Gundlach and Van Zwaluwenburg as *Cymindis* (probably the above).

**Rhombodera bicolor** Leconte  
(as *R. atrorufa* Reiche) Gundlach.  
Van Z. (P. R. 802).

**Brachinus glivipes** Mannerheim  
Stahl. Gundlach.

**Stenous tibialis** Chevrolat  
Stahl. Gundlach.  
at light at Guánica (640-13 det. Schwarz).

**Oodes femoralis** Chaudoir  
Stahl.

**Selenophorus alternans** Dejean  
Gundlach.

**Selenophorus discopunctatus** Dejean  
Gundlach. Leng & Mutchler 17-194.

**Selenophorus flavilabris** Dejean  
Leng & Mutchler 17-194.

**Selenophorus parumpunctatus** Dejean  
Stahl. Gundlach.  
in sea-weed on the beach at Pt. Cangrejos (GNW).

**Selenophorus pyritosus** Dejean  
Stahl. Gundlach.  
at light at Guánica (574-13).

**Selenophorus** sp.  
Wetmore 16-39, 61, 91: eaten by Killdeer, Ani and Mockingbird.

#### HALIPLIDÆ.

**Haliplus** sp.—det. Schwarz.  
at light at Manatí (228-16).

## DYTISCIDÆ.

**Hyphydus obniger** Chevrolat  
Gundlach.

**Laccophilus proximus** Say (o *sambi americanus* Aube) Stahl.  
Stahl. Gundlach.

**Pachydrus globosus** Aube  
Leng & Mutchler.

**Pachydrus brevis** Sharp—det. Schwarz  
at light at Vega Alta (162-15).

(**Hydroporus exilis**  
Stahl.)

**Copelatus angustatus** Chevrolat  
Gundlach.

(as sp.) Wetmore 16-84, 87: eaten by Wood Pewee and Cliff  
Swallow.  
(676-16 det. Schwarz.)

**Thermonectes circumscriptus** Latreille  
(as *Acilius*) Gundlach.

Wetmore 16-22: eaten by Green Heron.  
Leng & Mutchler 17-196: recorded by Gundlach.  
in small stream at Espinosa (506-17 det. Schwarz).

**Thermonectes margineguttatus** Aube  
(as *Acilius*) Gundlach.

Leng & Mutchler 17-196: recorded by Gundlach.

**Megadytes fraternus** Sharp

(as *Cybister laevigatus* Fabr.) Stahl. Gundlach.  
Leng & Mutchler 17-196: recorded by Gundlach.  
at light at Guánica (1050-13 det. Schwarz), crawling over  
mud near stream (31-17).

**Megadytes giganteus** Castelnau

(as *Cybister l'herminieri* Guerin) Stahl. Gundlach.  
Leng & Mutchler 17-196: recorded by Gundlach and Van Zwa-  
luenburg.

## GYRINIDÆ.

**Dineutes metalicus** Aube

Stahl. Gundlach. AMNH.

**Dineutes longimanus** Olivier

Gundlach.

in stream at Aibonito (577-16 det. Schwarz).

## HYDROPHILIDÆ.

**Ochthebius** sp. nov.—det. Schwarz.

at Santa Isabel, flying in great abundance in early morning  
(121-13).

**Hydrochus pallipes** Chevrolat

Gundlach.

(as sp.) Wetmore 16-66: eaten by Tody, *Todus mexicanus*.**Berosus** sp.

Wetmore 16-24, 39, 41, 42, 66, 67, 84: eaten by Blue Heron, Sandpipers, Tody and Cliff Swallow.

**Hydrophilus (Hydrous) tenebrioides** Jacq. Duval(as *Hydrous*) Stahl. Gundlach.

(as sp.) Wetmore 16-24: eaten by Little Blue Heron.

at light (663-17, 291-22), at Pt. Cangrejos (GNW), at Santana (215-16), at Guánica (1147-13 det. Schwarz).

**Stethoxus insularis** Castelnau(as *Hydrophilus*) Stahl. Gundlach.

Leng &amp; Mutchler 17-197.

**Stethoxus intermedius** Jacq. Duval(as *Hydrophilus*) Stahl. Gundlach.(as *S. ater* Olivier) Wetmore 16-24: eaten by Little Blue Heron.(in synonymy with *S. ater* Olivier) Leng & Mutchler.Leng & Mutchler 17-196: from Culebra Island. According to Mr. F. Wintersteiner "not identical with the Central American species *ater* (Olivier)."

at light (36-10 det. Schwarz), at Aibonito (SSC).

**Tropisternus collaris** Fabricius

Stahl. Gundlach.

Wetmore 16-22, 87: eaten by Green Heron and Martin.

**Tropisternus chalybeus** Castelnau

Leng &amp; Mutchler 17-192.

(as sp.) Wetmore 16-63: eaten by Woodpecker.

**Tropisternus lateralis** Fabricius

Stahl. Gundlach.

(as *T. nimbatus* Say) Wetmore 16-24: eaten by Little Blue Heron.

in pool of water (32-17 det. Schwarz, 711-16).

**Philhydrus melanocephalus** Fabricius

Gundlach. (as sp.) Wetmore 16-39: eaten by Killdeer.

**Philhydrus nebulosus** Say

Leng &amp; Mutchler 17-197.

**Philhydrus ochracea** Melsheimer

Leng &amp; Mutchler 17-197.

**Dactylosternum advectum** Horn

Leng &amp; Mutchler 17-197.

**Dactylosternum flavicorne** Mulsant(as *Cyclonotum*) Stahl. Gundlach.common under bark of decaying bucare tree, *Erythrina glauca*, at Cayey (302-17 det. as sp. Schwarz).**Oosternum costatum** Sharp

Leng &amp; Mutchler 17-197.

**Phaenonotum estriatum** Say—det. Schwarzat light (455-16), in stomach of lizzard, *Anolis pulchellus* (297-23); common on cane trash at Arecibo (1069-16).**Cereyon** sp.

Wetmore 16-87: eaten by Cliff Swallow.

## SCYDMANIDÆ.

**Euconnus coralinus** Reitter

Leng &amp; Mutchler.

**Euconnus testaceus** Schaum

Leng &amp; Mutchler.

**Napochus tantillus** Reitter

Leng &amp; Mutchler.

**Napochus amoenus** Reitter

Leng &amp; Mutchler.

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## STAPHYLINIDÆ.

**Piestus erythropus** Erichson

Stahl.

**Lispinus attenuatus** Erichson

Leng &amp; Mutchler.

**Lispinus laticollis** Erichson

Leng &amp; Mutchler.

**Ancaeus exiguus** Erichson

Leng &amp; Mutchler.

**Thoracophorus dentricollis** Erichson

Leng &amp; Mutchler.

**Ornarium pedicularium** Erichson

Leng &amp; Mutchler.

**Trogophloeus aridus** Jacq. Duval

Gundlach.

**Trogophloeus fulvipes** Erichson(as *T. aequalis* Jacq. Duval) Gundlach.

Leng &amp; Mutchler.



**Holotrochus cylindricus** Erichson  
Leng & Mutchler.

**Pinophilus flavipes** Erichson  
Leng & Mutchler.

**Pinophilus latipes** Gravenhorst  
Gundlach.

**Stilicopsis exigua** Erichson  
Leng & Mutchler.

**Lithocharis dorsalis** Erichson  
Leng & Mutchler.

**Lithocharis ochracea** Gravenhorst  
Gundlach.

**Lithocharis posticata** Erichson  
Leng & Mutchler.

**Scopaeus fasciatellus** Erichson  
Leng & Mutchler.

**Scopaeus pygmaeus** Erichson  
Leng & Mutchler.

**Cryptobium albipes** Erichson  
Leng & Mutchler.

**Cryptobium fulvipes** Erichson  
Leng & Mutchler.

**Paederomimus lustralis** Erichson  
Leng & Mutchler.

**Philonthus alumnus** Erichson  
Leng & Mutchler.

**Philonthus havaniensis** Castelnau  
Leng & Mutchler.

**Philonthus humilis** Erichson  
Leng & Mutchler.

**Belonuchus gagates** Erichson  
Leng & Mutchler.

**Xantholinus attenuatus** Erichson  
at Guánica (542-13 det. Schwarz).  
Leng & Mutchler. Merrill 15-54: in fresh cow dung.

**Cilea hepatica** Erichson  
Leng & Mutchler.

**Cilea rutilus** Erichson  
Leng & Mutchler.

**Cilea pulchellus** Erichson  
Leng & Mutchler.

**Erchomus piceus** Erichson  
Leng & Mutchler.

**Erchomus apicalis** Erichson  
Leng & Mutchler.

**Erchomus nitidulus** Erichson  
Leng & Mutchler.

**Coproporus terminalis** Erichson  
Leng & Mutchler.

**Bolitobius obscurus** Erichson  
Leng & Mutchler.

**Gyrophæna** sp.—det. Schwarz.  
common on a fungus, *Daedalea amanitoides* (1221-13).

**Aleochara** sp. nov.—det. Schwarz.  
in cow dung at Guánica (GBM).

**Hoplandria terminata** Erichson  
Leng & Mutchler.

PSELAPHIDÆ.

**Acratrichis atomaria** DeGeer  
Leng & Mutchler.

**Melba eggersi** Reitter  
Leng & Mutchler.

**Melba parmata** Reitter  
Leng & Mutchler.

**Melba ventricola** Reitter  
Leng & Mutchler.

PTILIIDÆ.

**Reichenbachia encera** Aube  
Leng & Mutchler.

HISTERIDÆ.

**Lioderma interrupta** Marseul.  
(as *L. ruptistria* Marseul) Gundlach.  
Leng & Mutchler 17-203: recorded by Gundlach.

**Lioderma 4-dentatum** Fabricius—det. Schwarz.  
under bark of decaying bucare tree, *Erythrina glauca*, at  
Cayey (245-17).

**Hister sp.**

Wetmore 16-100: eaten by Waterthrush.

**Omalodes kugii** Marseul

Gundlach.

**Omalodes ruficlavis** Sharp—det. Schwarz

under bark of decaying bucare tree, *Erythrina glauca*, at Cayey (246-17, 358-22); resting on grapefruit leaf at Manatí (155-15).

**Epierus antillarum** Marseul

Leng & Mutchler.

**Epierus waterhousei** Marseul

Leng & Mutchler 17-203.

**Atholus confinis** Erichson

Leng & Mutchler 17-203.

**Carnicops troglodytes** Paykull

Gundlach.

**Acritus analis** Leconte

Gundlach, "muy pequeña (no pasa de 1 mm. en longitud)." in cow dung at Guánica (544-13 det. Schwarz).

LYCIDÆ.

LITERATURE.

**Leng, C. W. & Mutchler, A. J.,** "The Lycidae, Lampyridae and Cantharidae (Tenebrionidae) of the West Indies." Bulletin American Museum of Natural History, Vol. 46, Art. 8, pp. 413-499, fig. 65, New York, August 24, 1922.

**Mutchler, A. J.,** "Notes on West Indian Lycidae and Lampyridae (Coleoptera), with Descriptions of New Forms." American Museum Novitates No. 60, pp. 1-13, fig. 1, New York, March 15, 1923.

**Mutchler, A. J.,** "Notes on West Indian Lampyridae and Cantharidae (Coleoptera) with Descriptions of New Forms." American Museum Novitates No. 63, pp. 1-9, fig. 1, New York, March 29, 1923.

Specimens of Lampyridae and Cantharidae determined by Messrs. Leng & Mutchler are noted by "det. L. & M." placed after the accession number or the initials of the collector.

**Thonalmus chevrolati** Bourgeois(as *Calopteron suave* J. Duval) Stahl.(as *Calopteron bicolor* Linn.) Van Z. (P. R. 807).

Leng &amp; Mutchler 22-422: "in Porto Rico, by commercial introduction only, . . . at Guánica, April in boat-load of cane from Higueral, (R. H. Zwaluwenburg)."

**Leptolycus heterocornis** Leng & Mutchler 22-430 and 431, fig. 12,  
TYPE from Porto Rico: swept from vegetation at Aibonito and Cayey.**Leptolycus heterocornis** var. *flavicollis* Leng & Mutchler 22-431,  
TYPE of variety from Aibonito, Porto Rico.

## LAMPYRIDÆ.

**Lucidiota decorus** Gemminger & Harold(as *Pholinus decorus* E. Olivier) Leng & Mutchler 14-432.

Leng &amp; Mutchler 22-536: redescribed, from Naguabo, Coamo Springs, Corozal Cave and Bayamón.

on coffee leaves (84-21); on grapefruit leaves at Vega Alta (104-17 det. L. & M.); on El Duque at Naguabo (725-14); on leaves of *Solanum torvum* at Barranquitas (404-22).**Lucidiota marginipennis** Leng & Mutchler 22-438, TYPE from Aibonito, Porto Rico.**Callophisma boreconca** Leng & Mutchler 22-440 and 441, figs. 17 & 17a, TYPE from Porto Rico: at Mayagüez, Adjuntas and Martin Peña.(as *Lychnuris dimidiatipennis* J. Duval) Stahl.

Mutchler 23 (No. 60) -9: from Vega Alta and Lares.

on grapefruit foliage at Vega Alta (103-17 det. L. &amp; M.); on coffee leaves at Lares (131-21 det. L. &amp; M.), at Yauco (108-23).

**Callophisma emarginata** Leng & Mutchler 22-443, figs. 22 & 22a,  
TYPE from Porto Rico: at Mayagüez, Adjuntas, Río Blanco Valley and Utuado.**Pyractomena galeata** E. Olivier, Bull. Soc. Zool. France, Vol. 24,  
p. 91, 1899, TYPE from Porto Rico and St. Thomas.(as *Lecontea*) Leng & Mutchler 14-432.

Leng &amp; Mutchler 22-453: at Fajardo, Arroyo, Aibonito, Manatí, Arecibo, Aguadilla and Santa Rita, and from Vieques Island.

Mutchler 23 (No. 60) -13: from La Plata.

at La Plata (GBM det. L. &amp; M.); at Barceloneta (218-16); resting in cotton boll at Pt. Cangrejos (394-22).

**Photinus heterodoxus** Leng & Mutchler 22-457 and 459, fig. 29, TYPE from Porto Rico: at Adjuntas and Fajardo.

Mutchler 23 (No. 63) -1: notes.

(unlabeled specimens — det. L. & M.).

**Photinus dubiosus** Leng & Mutchler 22-461, fig. 30, TYPE from Porto Rico: at Adjuntas, Mayagüez, Añasco, Maricao, Arecibo, Manatí, Aibonito, Caguas and Arroyo.

Mutchler 23 (No. 63) -2: from Lares and Río Piedras.

(as *P. glaucus*) Wetmore 16-106, 114, 116: eaten by Yellow Warbler, Yellow-Shouldered Blackbird and Oriole.

at light at Guánica (187-15) and on weeds (386-21); on coffee leaves (85-21 det. L. & M.), at Lares (107-22 det. L. & M.), at Ciales (57-21), in mountains north of Yauco (307-21), at San Sebastián (100-21); on *Solanum torvum* at Barranquitas (405-22); at Aibonito (SSC); on cotton at Boquerón (34-23).

**Photinus triangularis** E. Olivier, Ann. Soc. Ent. Belgique, Vol. 56, p. 25, 1912; Rev. Sci. du Bourbonnais, Vol. 25, p. 33, TYPE from El Yunque, Porto Rico.

Leng & Mutchler 14-432.

Leng & Mutchler 22-462, fig. 31: from Culebra Island.

**Photinus vittatus** G. A. Olivier, "Entomologie" II, No. 28, p. 23, pl. 3, fig. 20, 1790, TYPE from Porto Rico and Santo Domingo.

Wetmore 16-87, 106, 108: eaten by Cliff Swallow and Warblers. (as sp.) Wetmore 16-80, 96, 108: eaten by Petchary, Vireo and Parula Warbler.

Leng & Mutchler 22-478: short description, from many localities.

Mutchler 23 (No. 63) -7: from Guánica, Toa Alta and La Plata.

at light at Guánica (578-13), at La Plata (GBM — det. L. & M.); on sugar cane (GNW) at Guánica and Toa Alta (GNW — det. L. & M.); on coffee at Añasco (1371-12); on grapefruit at Vega Baja (513-16).

#### CANTHARIDÆ (TELEPHORIDÆ).

**Tytthonyx cavicornis** Leng & Mutchler 22-489, fig. 55, TYPE from Mona Island.

**Tytthonyx discolor** Leng & Mutchler 22-490, figs. 54 & 54a, TYPE from Aibonito, Porto Rico: also from Desecheo Island.

Mutchler 23 (No. 63) -9: from Lares.

(one specimen from Lares or Camuy, det. L. & M.)

**Tylocerus barberi** Leng & Mutchler 22-497, fig. 65, TYPE from Manatí, Porto Rico: from many localities, "most of the specimens collected at light."

on corn (535-12 paraTYPE); at light at Guánica (578-13 paraTYPE), at La Plata (GBM, July 11, 1915); at Cayey (27-21); on water-sprout of undetermined tree in large numbers, at Barceloneta (217-16); resting on grapefruit foliage at Vega Baja (514-16).

## MELRRIDÆ.

**Alymeris** sp.—det. G. E. Bryant

on cotton boll at Pt. Cangrejos (399-22).

## CLERIDÆ.

**Opilo unifasciatus** Erichson

Gundlach, determined by M. Chevrolat.

**Callotillus cruseo** Wolcott, A. B., "Two New Species of West Indian Cleridae." American Museum Novitates, No. 59, Feb. 14, 1923, pp. 1-3, fig. 1, TYPE from Camuy, Porto Rico. on ground at Camuy (204-22 TYPE).

## OEDEMERIDÆ.

**Oxaxis geniculata** Chevrolat 77-X, TYPE from Porto Rico.

Stahl. Gundlach. Leng & Mutchler.

common on the beach in the spring, at Loíza (130-16) attracted by fire, and on flowers of *Metastelma* sp., on leaves of *Coccoloba uvifera* (257-16); attracted by light in Condado (130a-16), at Plantaje and Palo Seco (229-16), at Pt. Cangrejos (GNW). Larger specimens have a pinkish iridescence, smaller ones are greenish.

**Ananca vittata** Fabricius

Chevrolat 77-X. Gundlach. Leng & Mutchler.

Leng & Mutchler 17-215: from Vieques Island.

common at light near beach (277-12), at Santurce (141-22), at Pt. Cangrejos (January to March, GNW), at Aguirre (160- May 3, 1916), at Guánica (568- July and August 1913).

## MORDELLIDÆ.

**Mordella basifulva** Quedenfeldt, G., 86-125, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

(as sp.) on *Casearia* flowers at Trujillo Alto (887-13 det. Schwarz).

**Mordella leucocephala** Quedenfeldt, G., 86-124, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

**Mordella scutellaris** Fabricius

Quedenfeldt. Gundlach. Leng & Mutchler.



**Moredellistena signaticollis** Quedenfeldt, G., (as *Mordella*) 86-125, TYPE from Porto Rico.

(as *Mordella*) Gundlach.

Leng & Mutchler.

(as sp.) Wetmore 16-84: eaten by Wood Pewee.

**Mordellistena annuliventris** Quedenfeldt, G., 86-126, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

(as sp.) Wetmore 16-99, 106: eaten by Redstart and Yellow Warbler.

**Mordellistena ferruginea** Fabricius

Quedenfeldt. Gundlach. Leng & Mutchler.

#### RHIPIPHORIDÆ.

**Macrosiagon basalis** Gerstaecker

(as *Rhipiphorus*) Quedenfeldt 86-128. Gundlach.

Leng & Mutchler.

**Macrosiagon discicolle mutilatus** Gerstaecker

(as *Rhipiphorus*) Quedenfeldt 86-128. Gundlach.

Leng & Mutchler.

**Macrosiagon discicolle melanoptera** Chevrolat, A., (as *Emenadia*) 87-IX, TYPE from Porto Rico.

Gundlach, "M. Chevrolat nombre una variedad *Emenadia melanoptera* en 1887 en la Rev. Zool."

Leng & Mutchler.

**Macrosiagon discicolle quadrimaculatus** Gerstaecker

(as *Rhipiphorus*) Quedenfeldt 86-128. Gundlach.

Leng & Mutchler.

**Rhipiphorus sordidum** Gerstaecker, var. **major** Quedenfeldt, G., 86-128, TYPE of variety from Porto Rico.

Gundlach. Leng & Mutchler.

(as sp.) Wetmore 16-89: eaten by Martin.

#### MELOIDÆ.

**Epicauta annulicornis** Chevrolat, A., 77-IX, TYPE from Porto Rico. Gundlach.

(as *Cantharsis*) Leng & Mutchler.

(as *Macrobasis*) Van Z. (P. R. 803).

**Epicauta obscuricornis** Chevrolat, A., 77-IX, TYPE from Porto Rico. Gundlach.

(as *Cantharsis*) Leng & Mutchler.

**Zonitis** sp.—det. Schwarz

Mostly dull yellow in color, median area of disc of prothorax and two large longitudinal bands on each elytra brown; length 11 mm.

at light at Guánica (590-13).

**Zonitis** sp.—det. Schwarz

15-16 mm. long: areas of brown at base and near apex of elytra.

at light at Guánica (613-13).

**Horia auriculata** Duges—det. Schwarz

(a single unlabeled female.)

**Tetraonyx quadrimaculatus** Fabricius

Chevrolat 77-X. Stahl. Gundlach. Leng & Mutchler.

(209-13 det. Schwarz); on flowers of *Aeschynomena americana* at Arecibo (3-17).

## ANTHICIDÆ.

**Anthicus floralis** Paykull

Stahl. Quedenfeldt. Gundlach. Leng & Mutchler.

Wetmore 16-114: eaten by Yellow-Shouldered Blackbird.

abundant in central whorl of young shoots of sugar cane at Arecibo (636-21).

**Anthicus vicinus** LeFerté—Sénéctère, M. F. T. de, "Monographie des *Anthicus* et. gen. voisins" Paris, 1848, p. 157, TYPE, given as "America borealis," from Porto Rico.

(and as *A. fulvomicans* Quedenfeldt, G. 86-122, TYPE from Porto Rico) Gundlach. Leng & Mutchler.

Merrill 15-54: in fresh cow dung.

in cow dung at Guánica (GBM — det. Schwarz), (and probably this species: ferrugineous, shining, not pubescent, legs lighter in color, elytra densely punctate, dark at apex and about the middle) under old cow manure at Guánica (543-13).

**Anthicus** sp. poss. **fulvipes** LaFerté—det. Schwarz

among aphids under okra leaves (733-13).

**Notoxus bipunctatus** Chevrolat, A., Ann. Soc. Ent. France (5), VII, Bulletin p. ix, 1877, TYPE from Porto Rico.

Leng & Mutchler.

at light at Pt. Cangrejos (GNW, Dec. 1919, — Feb. 1920, det. Schwarz).

**Notoxus dentipennis** Chevrolat, A., Bull. Soc. Ent. France, (5), VII, Bulletin p. ix, December, 1877, TYPE from Porto Rico.

(as *N. krugii* Quedenfeldt, G., 86-121, TYPE from Porto Rico.) Gundlach.

## ELATERIDÆ.

Mr. R. H. Van Zwaluwenburg, at the time he was in the United States Bureau of Entomology, determined all the species of Elateridae here listed.

**Pyrophorus luminosus** Illiger, J. C. W., "Monogr. d. Elateren (*Pyrophorus*)". Mag. Gesellschaft nat. Fr. 1, p. 149, 1807, TYPE from Porto Rico.

(as *Elater phosphoreus*) Ledru 1780.

(as *P. pyralis* Germar or *P. phosphoreus* Fabr.) Stahl.

Gundlach. Leng & Mutchler. Van Z. (P. R. 23) adults in decaying fallen mangoes, larvae predatory of white grubs.

Wolcott, G. N., "El Cucubano, *Pyrophorus luminosus* Ill." Circular 80, Insular Experiment Station, Río Piedras, Oct. 1923. pp. 5-8, figs. 3.

in April (75-11, 253-12, 295-12 at Pueblo Viejo, 313-12, 392-13, 107-21), in February (71-23); at Toa Baja in April (93-15); at Hormigueros in March (THJ); at Aibonito in July (SSC); at Yauco in July (765-15).

**Monocrepidus bifoveatus** Palisot de Beauvois

Wetmore 16-61, 96, 114, 119: eaten by Ani, Latimer's Vireo, Yellow-Shouldered Blackbird and Mozambique.

at light (140-April, 1922, 180-July, 1921), at Pt. Cangrejos (April and May, 1920, GNW), one adult at Guánica (705-June, 1914); on grapefruit foliage at Vega Baja (494-August, 1916), at Barceloneta (220-June, 1916); at Pt. Cangrejos on *Corchorus hirsutus* (81-June, 1916); in cotton squares at Isabela (167-June, 1921), at Hatillo (298-October, 1922); in empty cocoons of *Alabama argillacea* Hübner at Hatillo (202-August, 1922).

**Monocrepidus lividus** DeGeer

(as sp.) Wetmore 16-84, 106: eaten by Wood Pewee and Yellow Warbler.

at light at Pt. Cangrejos (January to May, 1920, GNW); at Hatillo in cocoons of *Alabama argillacea* Hübner (202-August, 1922).

**Monocrepidus pinguis** Candeze

at light (74-April, 1911), at Aibonito (June 1, 1913, SSC).

**Monocrepidus memorabilis** Candeze

at light at Guánica (506½-13).

**Heteroderes amphicollis** Gyllenhal (?)

in earth (243-12).

**Aeolus binotatus** Candeze (?)

under cane trash at Arecibo (189-11).

**Aeolus elegans** Fabricius

Gundlach.

(as *Drasterius* sp.) Wetmore 16-22: eaten by Cuban Green Heron.

on leaves of eggplant (735-13, 343-17); on leaves of *Rauwolfia nitida* at Yauco (316-21); on leaves of undetermined plant at Barceloneta (219-16); in excrement of *Laphygma frugiperda* S. & A., on corn at Aguadilla (27-22); in cotton squares at Garrochales (299-22).

**Aeolus** sp.—det. Schwarz.

only 3 mm. long, elytra densely ciliate and punctate, lighter brown in color than the polished prothorax, with a small elongate dark brown area on the outer margin opposite a large, irregularly-semicircular, piceous spot about the middle of the inner margin, which is dark brown almost to apex.

in pile of coconut husks near beach at Arecibo (250-22).

## EUCNEMIDÆ.

**Arrhipis lanieri** Guérin

Leng &amp; Mutchler.

**Microrhagus** sp.Wetmore 16-66: eaten by P. R. Tody, *Todus mexicanus*.

## TRIXAYIDÆ.

**Drapetes chalybeus** Gerstaecker

Leng &amp; Mutchler.

## BUPRESTIDÆ.

Mr. W. S. Fisher has examined, and has determined or will describe all specimens of Buprestidae in the Insular Station collection.

**Acmaeodera** sp. nov.

on mangrove flowers at Martin Peña (524-17); on sugar cane at Guánica (175-22).

**Acmaeodera** sp. nov.

(as sp.) Wetmore 16-77, 80, 82, 96, 125: eaten by Kingbird, Petchary, Flycatcher, Latimer's Vireo and Grossbeak.  
on mangrove flowers at Martin Peña (523-17).

**Buprestis lineata** Fabricius(as *Ancylochira*) Stahl. Gundlach.**Buprestis decora** Olivier(as *Ancylochira*) Gundlach.**Chrysobothris denticulata** Castelnau & GoryWetmore 16-80: eaten by Petchary, *Tolmarchus taylori*.

**Chrysobothris tranquebarica** Gmelin(as *C. impressa* Fabr.) Stahl. Gundlach.Van Z. (P. R. 1668) on *Eucalyptus* sp.

(as sp.) Wetmore 16-84, 119: eaten by Wood Pewee and Mozambique.

on stump at San Sebastián (97-21).

**Chrysobothris lepida** Castelnau & Gory

Gundlach.

**Chrysobothris megacephala** Castelnau & Gory

(176-22 — date and locality unknown.)

**Chrysobothris** sp. nov.

thorax dark red, abdomen blue, elytra black with four transverse iridescent green bands: about 6 mm. long.

(798-12.)

**Taphrocerus** sp. nov.

on El Yunque at Mameyes (329-17).

## HELODIDÆ.

**Scirtes** sp.—det. Marshall

in cotton squares at Algarroba (198-22).

## CHELONARIIDÆ.

**Chelonarium punctatum** Fabricius

Stahl. Gundlach.

resting on leaf of *Inga vera* at Ciales (219-22); elytra in bird dung at Camuy (GMW); larva in rotten stump at Lares, reared to adult (164-21 det. Schwarz).

## DERMESTIDÆ.

**Dermestes vulpinus** Fabricius

Stahl. Gundlach.

**Dermestes carnivorus** Fabricius

Stahl. Gundlach.

**Cryptorhpalum** sp.

Wetmore 16-104, 106, 108: eaten by Warblers.

**Trogoderma insulare** Chevrolat

Stahl. Gundlach.

**Globocornis fulvipes** Guérin(as *Trogoderma*) Stahl. Gundlach.**Attagenus piceus** Olivier—det. Schwarz

on cotton at Quebradillas (307-22).

## OSTOMIDÆ (TEMNOCHILIDÆ TROGOSITIDÆ).

**Temnochila aenea** Olivier

Leng &amp; Mutchler.

**Temnochila portoricensis** Leveille, A., Ann. Soc. Ent. France, Vol. 76, p. 401, 1907, TYPE from Porto Rico.

Leng &amp; Mutchler.

(as sp.) Wetmore 16-63: eaten by Woodpecker.

**Tenebroides punctulata** Chevrolat(as *Trogosita*) Stahl.

(as sp.) Wetmore 16-63, 66: eaten by Woodpecker and Tody.

Leng &amp; Mutchler.

**Tenebroides transversicollis** Jacq. Duval(as *Trogosita*) Gundlach.**Tenebroides mauritanicus** Linn.—det. Cotton

reared from rice (314-22).

## NITIDULIDÆ.

**Colopterus amputatus** Erichson

Leng &amp; Mutchler.

**Colopterus truncatus** Randall

Leng &amp; Mutchler.

**Conotelus fuscipennis** Erichson

Stahl. Gundlach, "se le encuentra amenudo en el caliz de las flores."

(as *C. conicus* Fabr.) Leng & Mutchler 17-203.in flowers of *Partium tiliaceum* at Ciales (280-22 det.Schwarz); in flowers of *Tecoma pentaphylla* (266-12).**Carpophilus dimidiatus** Fabricius

Van Z. (P. R. 1514) in corn meal.

in flour (290-17 — det. doubtful).

**Carpophilus dimidatus**, var. *mutilatus* Erichson

Leng &amp; Mutchler 17-203: from Vieques Island.

**Carpophilus hemipterus** Linn.—det. Schwarz

Wetmore 16-89: eaten by Martin.

on decaying cane seed (349-12).

**Haptoncus luteolus** Erichson(as *Epurma*) Gundlach.Wetmore 16-74: eaten by Flycatcher, *Anthracothonax aurentus*.

under leaf-sheaths of sugar cane (202-11 det. Schwarz), very abundant on cane chewed by rats (726-13 det. Schwarz); on tassels of corn growing in cane field at Trujillo Alto (724-12 det. Schwarz).



**Stelidota geminata** Say

Gundlach.

(as sp.) Wetmore 16-75, 87: eaten by Swift and Cliff Swallow.

**Stelidota ruderata** Erichson

Gundlach.

**Lobiopa decumana** Erichson

Stahl. Gundlach.

(as *L. insularis* Castelnau) Leng & Mutchler 17-203: recorded by Gudlach.all stages in fruit of *Psidium guajava* on the ground (224-16 det. Schwarz).

## MONOTOMIDÆ.

**Europs apicalis** Reitter

Wetmore 16-116, 121: eaten by Oriole and Tanager.

in pods of *Inga laurina* at Lares (111-22 det. Schwarz).

## CUCUJIDÆ.

**Silvanus surinamensis** Linn.

Van Z. (1512) in stored grain. Wolcott 22b-6: notes.

in corn (613-17), in rice (625-17), in dry dates (94-21), in almonds (369-22).

**Silvanus gemellatus** Jacq. Duvalin pods of "aroma", *Acacia farnesiana*, at Boquerón (101-23).**Cathartus advena** Waltl(as *Silvanus*) Gundlach. Riley & Howard, Insect Life, Vol. 6, Feb. 1894, p. 218.**Nausibius clavicornis** Kugelann(as *N. dentatus* Marsham) Stahl. Gundlach.

Wolcott 22b-6: in brown sugar, notes.

**Laemophloeus adustus** Leconte

Gundlach.

**Laemophloeus unicornis** Grouvelle

Leng &amp; Mutchler.

**Laemophloeus pusillus** Schönherr

Leng &amp; Mutchler 17-201.

(as *L. minutus* Oliv.) Wolcott 22b-6: in flour and soup pastes. in wheat flour (1209-13, 291-17), in macaroni (620-17 det. Cotton), in seeds (651-17).**Telephanus pallidulus** Chevrolat

Leng &amp; Mutchler. Wolcott 21-44, fig. 19: larvae and adults under leaf-sheaths of sugar cane and on dry banana leaves, notes.

under leaf-sheaths of sugar cane (391-12, 272-13, 359-13 det. Schwarz), at Camuy, Barceloneta and Córseica (GNW).

## CRYPTOPHAGIDÆ.

**Loberus testaceus** Reitter

Leng &amp; Mutchler 17-202.

(as sp.) Wetmore 16-66, 74: eaten by Tody, *Todus mexicanus*, and Flycatcher, *Anthracothorax aurulentus*.(det. as sp. near *testaceus* by Mr. G. E. Bryant) in cotton bolls injured by Pink Bollworm at Pt. Cangrejos (400-22); in buds of majagua, *Partium tiliaceum*, at Arecibo (254-22); in pods of *Acacia farnesiana* at Boquerón (103-23).

## MYCETOPHAGIDÆ.

**Typhaea semirufa** Chevrolat

Gundlach.

**Litargus** sp.

Wetmore 16-108: eaten by Northern Parula Warbler.

## COLYDIDÆ.

**Euxestus erithacus** ChevrolatLeng & Mutchler. Leng & Mutchler 17-200: "probably not more than a variety of *E. parki* Wollaston."**Synchita granulata** Say(as *Erndeitoma*) Wetmore 16-108: eaten by Black & White Warbler.under bark of *Inga vera* at Cayey (248-22 det. Mutchler, 1-23); under bark of fence post at Boquerón (172-23).**Bitoma trifasciata** Moritz(as *Ditoma*) Leng & Mutchler.**Aulonium bidentatum** Fabricius

Gundlach. Leng &amp; Mutchler.

Wetmore 16-108: eaten by Black & White Warbler, *Mniotilta varia*.**Penthelispa acqueicolle** Reitter

Leng &amp; Mutchler.

**Neotrichus tuberculata** Chevrolat

Leng &amp; Mutchler.

**Eulachus semifuliginosus** Chevrolat

Gundlach. Leng &amp; Mutchler.

**Cryptozoon civile** Schaufuss

Leng &amp; Mutchler.

**Cryptozoon nitidicole** Schaufuss

Leng &amp; Mutchler.

**Ceryldon exaratum** Chevrolat

Leng &amp; Mutchler.

LANTHRIDIIDÆ.

“*Lathridius fasciatus* es su nombre en la colección del Museo de Berlín.”

Gundlach.

PHALACRIDÆ.

*Olibrus* sp.

Wetmore 16-108: eaten by Northern Parula Warbler.

COCCINELLIDÆ.

LITERATURE.

Sicard, “Descriptions de Varietes, Especies et Generes nouveaux appartenant a la Famille des Coccinellides.” Ann. & Mag. Nat. Hist., Ser. 9, Vol. 9, pp. 349-360, April, 1922.

*Hyperaspis apicalis* Mulsant (in Weise)

Gundlach. Leng & Mutchler. (as sp.) Jones 15b-13: notes.

Wetmore 16-89, 108, 119: eaten by Martin, Parula Warbler and Mozambique.

Wolcott 21-45: common in cane fields, predaceous on *Sipha flava* Forbes. Wolcott 22-6: notes.

on weeds in cane field (1-13, 75-13); feeding on aphids on okra (727-13 det. Schwarz); on sugar cane on which mealybugs were exposed by the leaf-sheath having been chewed away at Fajardo (909A-14); on flower spikes of *Heliotropum indicum* (191-16); feeding on *Aphis gossypii* Glover on cotton at Isabela (200-21); on sugar cane at Bayamón, Toa Baja, Caguas, Guánica and Patillas (GNW).

*Hyperaspis connectens* Thunberg (in Schönherr)

Gundlach. Leng & Mutchler.

on sugar cane at Guánica (517-13), at Aguirre (72-163), at Barceloneta, Córscica and Patillas (GNW—det. Schwarz); feeding on *Aphis gossypii* Glover on cotton at Isabela, more abundant than *H. apicalis* (199-21).

*Scymnus loewii* Mulsant

Leng & Mutchler.

Van Dine 13-257; Van Dine 13-32; Jones 15b-13; Wolcott 21-45: feeding on *Sipha flava* Forbes on sugar cane.

Wolcott 22-6: notes.

feeding on *Sipha flava* Forbes on sugar cane at Guánica (167-11, 168-11 det. Schwarz); feeding on *Aphis gossypii* Glover on cotton at Guánica (120-13), at Isabela (201-21), on sugar cane at Patillas and Guánica (GNW).

*Scymnus floralis* Fabricius

Gundlach.

*Scymnus phaleus* Mulsant

Gundlach.

**Scymnus roseicollis** Mulsant

(as *S. thoracicus* Fabricius) Gundlach. (and also as *S. ochroderus* Mulsant) Leng & Mutchler.

Wetmore 16-66, 84, 96, 99, 108, 111: eaten by Tody, Wood Pewee, Vireo, Redstart, Yellow and Parula Warblers, and Honey Creeper.

Van Dine 13-257; Van Dine 13-32; Jones 15b-13; Jones 14-462; Wolcott 21-45: predaceous on *Sipha flava* Forbes on sugar cane.

Jones 15b-17: predaceous on *Aphis setariae* Thos. on sugar cane.

Wolcott 22-6: notes and illustrations of larva, pupa and adult. feeding on *Sipha flava* Forbes on sugar cane (439-12, 607-12, 691-12), at Guánica (167-11, 168-11 det. Schwarz); on *Aphis setariae* Thos. on sugar cane (946-13); on *Aphis gossypii* Glover on cucumbers (421-12), on cotton (443-21), at Isabela (201-21); on aphids on okra (574-12, 728-13).

**Cryptolaemus montrouzieri** Mulsant

Van Dine 12-20: "introduced by this Station from California last season, has been distributed throughout all of the cane districts and has been recovered already from the field."

Van Dine 13-256; Van Dine 13-30: an enemy of *Pseudococcus sacchari* Ckll.

Leng & Mutchler 14-411: "(introduced)."

Wolcott 22d-17: the introduction from California, distribution in cane fields in Porto Rico to feed on mealy-bugs on sugar cane and subsequent recovery feeding on other mealy-bugs, and on fleshy scale-insects, but not on *Pseudococcus calceolariae* Maskell and *P. sacchari* Ckll., which are protected by the leaf-sheaths of the sugar cane.

feeding on *Pseudococcus citri* Risso on bucare trees, *Erythrina glauca* (42-21); feeding on *Pulvinaria psidii* Maskell on *Rawolfia nitida* at Guánica (317-21); on aphid-infested cotton at Guánica (105-13).

**Psorolyma maxillosa** Sicard 22-360, TYPE from Lares, Porto Rico:

"Ovalis, convexa nitida, coerulea; subtus piceo-brunnea; antennis, palpis, pedibusque pallide flavis. Mandibulis exsertis, oculis prominentibus distinctissimus. — Long 2.5 mm."

Wolcott 23-57: on coffee.

on coffee leaves at Lares (98-21 TYPE, 132-21, 294-21, 473-21, 294-22), also at San Sebastián, Corozal, Ciales, and most abundantly in the mountains north of Yauco, in September. The larva is grey with black spots, and often two or three occur on a single leaf, without apparent source of animal food, seldom found on young leaves infested with *Toxoptera aurantiae* Boyer.

**Scymnillus nunenmacheri** Sicard 22-355, TYPE from Río Piedras,

Porto Rico: "Subrotundatus, convexus, nitidus; supra nigro-

piceous, thoracis lateribus luteis; subtus brunneo-piceous, antennis, palpis pedibusque rufo-flavis. — Long 1.2–1.5 mm.”

abundant on citrus trees at Vega Alta (217–17); feeding on *Chrysomphalus dictyospermi* Morgan on *Cycas revoluta* (171–17), at Naguabo (335–17); feeding on *Aspidiotus destructor* Sign. on coconut palm (352–21 TYPE).

**Scymnillus variipennis** Sicard 22–354, TYPE from Río Piedras, Porto Rico: “Breviter ovatus, convexus, nitidus; supra rufus, elitis basi nigricantibus, subtus rufescens; antennis, palpis pedibusque flavis. Oculis nigris. — Long 1.5 mm.”  
(as sp.) Wetmore 16–66, 84, 98, 104, 108, 111: eaten by Tody, Wood Pewee, Vireo and Warblers, and Honey Creeper.

bluish-grey larvae, reddish-brown puparia and adults abundant on leaves of coconut palm infested with *Aspidiotus destructor* Sign. (350–21 TYPE), at Ponce (947–13); on leaves of *Psidium guajava* infested with whitefly, *Aleurodicus minima* Quaint., and mealybugs, *Pseudococcus nipae* Mask. (217–13, 274–13); on leaves of *Spondias jobo* infested with thrips, *Heliothrips rubrocincta* Giard (783–16); feeding on *Pseudococcus citri* Risso on grapefruit (235–17).

**Scymnillodes cyanescens** Sicard var. **violaceus** Sicard 22–358, TYPE variety from Río Piedras, Porto Rico: “Subrotundus, convexus, nitidus, supra cyaneus; antennis flavis, palpis rufis; subtus nigro-brunneus; pedibus rufis. Long 1.5 mm. — var. **violaceus** nov., Elytris violaceo-micantibus. Prothorace angustiore.”

feeding on *Aspidiotus destructor* Sign. on coconut palm (353–21 TYPE); feeding on *Asterolecanium bambusae* Bdv. at Vega Alta (41–17, 218–17).

**Psyllobora nana** Mulsant

feeding on red spider on beans (204–16, 428–16); on cotton at Isabela (203–21), at Quebradillas (306–22), at Guánica (38–22); on sugar cane at Martín Peña and Seboruco (Pt. Cangrejos) (GNW — det. Schwarz).

**Psyllobora lineolata** Fabricius

Gundlach.

presumably this species: elytra mostly yellow with several small black spots, on Isle of the Caves, Laguna de San José, Pt. Cangrejos (96–15); on cotton at Boquerón (92–23).

**Megilla innotata** Mulsant

Stahl. Gundlach. Leng & Mutchler.

Van Z. (5058) predaceous on *Sipha flava* Forbes.

Wolcott 22–6: notes.

Van Dine 13–257; Van Dine 13–32; Jones 15b–12; Wolcott 21–45: predaceous on *Sipha flava* Forbes.

on sugar cane (207–11, 30–12, 223–13), at Naguabo (33–10

det. Schwarz), at Humacao (56-10); feeding on *Sipha flava* Forbes on sugar cane (614-12), on aphids on okra (729-13), on aphids on beans (444-16); abundant on flowers of *Verbena*, *Mitracarpus* and other weeds, apparently feeding on pollen (500-16).

**Hippodamia convergens** Guerin (introduced)

Van Z. (5050) predaceous on *Aphis* spp.

**Cycloneda sanguinea** Linnaeus

(as *Daulis*) Stahl. (as *Neda*) Gundlach.

Leng & Mutchler. Van Z. (5093) predaceous on *Aphis* spp.

(as *C. limbifer*) Wetmore 16-61, 66, 77, 80, 84, 87, 98: eaten by Ani, Tody, Petchary, Wood Pewee, Elainea, Cliff Swallow and Vireo.

Van Dine 13-257; Van Dine 13-32; Jones 15b-12; Wolcott 21-45: predaceous on *Sipha flava* Forbes. Wolcott 22-6: notes.

on leaves of sugar cane infested with *Sipha flava* Forbes (13-12, 347-12 det. Schwarz), at Guánica (233-11), at Guayama (170-12), at Añasco (370-12), at Canovanas (717-12), at Trujillo Alto (723-12), at Toa Baja (143-13); reared on these aphids, yellow-spotted black larvae hatching from a small cluster of bright yellow eggs on April 20 & 21, pupating April 30 to May 2, adults issuing May 5 & 6 (417-12, 617-12, 665-12); at Aibonito (SSC), on dry hill north of Ponce (117-13); larvae and adults observed feeding on *Cerataphis lantaniae* Bdl. on palm (43-21); on *Carolinaia cyperi* Ainslie on sedge, *Cyperus rotundus*, at Bayamón (55-21); on *Aphis gossypii* Glover on cotton at Isabela (198-21); on aphids on okra (730-13).

**Daulis ferruginea** Olivier.

(as *Neda*) Gundlach. Leng & Mutchler.

Wolcott 23-57: on coffee.

larvae, pupae and adults quite abundant at Adjuntas, top of the pass to Ponce, on coffee leaves, although no aphids were present (485-21 det. Schwarz), in mountains north of Yauco (113-22), at Aibonito (693A-17); on *Inga laurina* infested with Psyllids, probably *Psylla minuticon*a Crawford, at Lares (146-22).

**Exochomus** sp.—det. G. E. Bryant

(as *Coccinella* sp. (?)) Wetmore 16-80: eaten by Petchary.

eaten by lizard, *Anolis cristatellus*, at Condado (302-23); on coconut fronds at Pt. Cangrejos (302-23), on the beach at Mameyes (343-22).

ALLECULIDÆ (CISTELIDÆ).

**Allecula flavipes** Jacq. Duval

Leng & Mutchler. (in synonymy with *A. fuscata*) Gundlach.



**Allecula fuscula** Schönherr

Quedenfeldt 86-119. Gundlach. Leng &amp; Mutchler.

**Cistela sobrina** Dejean

Stahl.

**Cteniacantha marginata** Quedenfeldt, G., 86-121, TYPE from Porto Rico.

Gundlach. Leng &amp; Mutchler 14-465: under Melandryidae.

**Hymenorus** sp.—det. Schwarz (possibly *fuscula* Schönherr—det. Mr. K. G. Blair)

very abundant on *Corchorus hirsutus* at Pt. Cangrejos (80-16), in dry sea-weed and under dead vegetation and at light (GNW); at light in Condado (183-16), at Pt. Salinas (292-22); in cotton squares and in empty pupa skins of *Alabama argillacea* Hübner close to the beach at Hatillo (203-22, 304-22).

## TENEBRIONIDÆ.

**Diastolinus fuscicornis** Chevrolat, A. A. M., Ann. Soc. Ent. France, (5), VII, Bulletin p. viii, 1877, TYPE from Porto Rico.

Gundlach. Leng &amp; Mutchler.

**Sellio** probably *tibidens* Quedenfeldt—det. Mr. K. G. Blair

under cow dung at Boquerón (171-23), at Salinas (282-23).

**Hopatrinus pullus** Sahlberg (= *anthracinus* Mulsant)—det. Schwarz from base of decaying pineapple slip (705-12).**Blapstinus** sp.—det. Schwarz (possibly *punctatus* Fabr.—det. K. G. Blair)

very abundant in soil in cane field at Guánica (654-14); under dry cow dung at Boquerón (93-23).

**Trachyscelis** (?) *flavipes* Melsheimer—det. K. G. Blair

on the beach at Pt. Cangrejos (108-23).

**Phaleria angustata** Chevrolat—det. Schwarz

in seaweed on the beach at Pt. Cangrejos (GNW, 109-23), at Pt. Salinas (293-22).

**Phaleria variabilis** Quedenfeldt, G., 86-128, TYPE from Porto Rico.

Gundlach, "esta especie varía mucho en su colorido que puede ser totalmente el pálido amarillo hasta casi el solo negro o amarillo con una mancha común oscura en forma de luna sobre el disco de los elitros."

*P. angustata* shows the same variation in color.**Crypticus** sp. possibly *obsoletus* Say—det. Schwarz.

Wetmore 16-39: eaten by Killdeer.

in seaweed on the beach at Pt. Cangrejos (GNW).

**Rhipidandrus micrographus** Lacordaire—det. Schwarz

larvae and adults abundant in polypore fungus, *Fomes australis*, at Jajome Alto (373-21), at Adjuntas (482-21).

**(Eledona pectinicornis**

Gundlach, "en el Museo de Berlín, acaso manuscrito.")

**Diaperis hydni** Fabricius

Stahl. Gundlach.

(as *D. maculata* Olivier) Leng & Mutchler 17-214.

all stages abundant in polypore fungus (355-12 det. Schwarz, 109-15), in fungus on palm (206-11).

**Palembus ocularis** Casey—det. Schwarz

all stages in tamarind pods, feeding on seeds, at Loíza (344-21).

**Platydemia apicale** Castelnau & Brulle

Gundlach.

**Platydemia excavatum** Say—det. G. E. Bryant

under bark of dead tree at Vega Baja (113-16).

**Platydemia picicorne** Fabricius

Gundlach.

(as sp.) Wetmore 16-63, 116, 128: eaten by Woodpecker, Oriole and Grasshopper Sparrow.

**Platydemia virens** Castelnau & Brulle

Wetmore 16-108: eaten by Black & White Warbler.

**Tribolium ferrugineum** Fabricius

Wolcott 22b-6: in flour. (as *Margus*) Gundlach.

in bran (35-12), in wheat flour (1208-13 det. Schwarz, 141-16, 7-21), in dry dates (95-21); at Aibonito (SSC); in cotton-seed meal stored in tobacco warehouse at Cayey (371-22); in dry tamarind pods at Guánica (544-14).

**Tribolium confusum** Jacq. Duval

Leng & Mutchler 17-214: recorded by Van Zwaluwenburg.

in cotton-seed meal stored in tobacco warehouse at Cayey (372-22).

**Alphitobius piceus** Olivier

(as *Heterophaga fagi* Panzer) Gundlach, "encontrado en almaces y en lugares donde existen sustancias descompuestas, secas." Also, with *Tenebrio mauritanicus* Fabr. in synonymy.

Leng & Mutchler 17-214: recorded by Gundlach.

**Sitophagus hololeptoides** Castelnau

Leng & Mutchler.

(as *Adelina livida* Chevrolat) Gundlach, "Acaso el nombre es manuscrito." Also (as *Hypogena*) Gundlach.

**Doliema pallida** Say—det. K. G. Blair

under bark of fence post at Boquerón (187-23).

**Alphitobius diaperinus** Panzer—det. Cotton

in wheat flour (9-21).

**Hypophloeus rufipes** Fabricius—det. Schwarz

under bark of decaying bucare tree, *Erythrina glauca*, at Cayey (301-17, 359-22).

**Helops** sp.

Wetmore 16-63, 82, 96, 98, 108, 116: eaten by Woodpecker, Fly-catcher, Wood Pewee, Vireos, Warblers and Oriole.

**Zophobas rugipes** Kirsch

Leng & Mutchler. AMNH at Corozal Cave.

(10-11, 55-11, 444-19), under boards in barn (122-15), at

Bayamón (342-16), at Caguas and Aibonito (SSC).

**Zophobas morio** Fabricius

Stahl. Gundlach, "se encuentra en las casas debajo de tablas, cajones, etc. Nunca lo he visto en el campo."

Van Z. (P. R. 25).

Leng & Mutchler 17-214: on Culebra Island.

**Pyanisia tristis** Castelnau

(as *Cymatothes*) Stahl. Gundlach.

**Strongylium pulvinatum** Maeklin

Leng & Mutchler.

(as sp.) Wetmore 16-96: eaten by Latimer's Vireo.

#### MONOMMIDÆ.

**Hyporhagus marginatus** Fabricius

(as *Monomma*) Stahl. Gundlach.

#### MELANDRYIDÆ.

**Cteniacantha marginata** Quedenfeldt, G., 86-121, TYPE from Porto Rico.

Gundlach 94-629: under Cistelidae.

Leng & Mutchler 14-465.

#### PTINIDÆ.

**Atractocerus brasiliensis** Laporte & Serville

Gundlach, "Solamente la he cogido cuando voló a la vela encendida en las casas de campo. Su vuelo es ruidoso o acompañado de un zumbido."

Leng & Mutchler.

**Ptinus** sp.

Wetmore 16-108: eaten by Northern Parula Warbler.

## ANOBIIDÆ.

**Lasioderma serricorne** Fabricius—det. Van Dine

Tower 10-26: "a beetle borer in tobacco warehouses, doing a great deal of damage to the stored leaf." Control by fumigation with cyanide.

in books (44-12), in flour (1210-13), eating the string on which camandula, *Coix lachryma*, beads were strung (105-16); at Aibonito (SSC); in cotton-seed meal stored in tobacco warehouse at Cayey (373-22); in stored tobacco at Cayey (374-22).

**Catorama** sp.

Wetmore 16-66, 72, 74: eaten by Tody and Hummingbirds.

**Dorcatoma bibliothecarum** Poey

Gundlach, "sumamente dañino, porque su larva perfora libros y destruye colecciones de historia natural, tanto zoológicas como botánicas."

(as *Calymmanderus*) Leng & Mutchler 17-206: recorded by Gundlach.

## BOSTRYCHIDÆ.

**Dinoderus minutus** Fabricius—det. Schwarz

in dry bamboo (120-11); very abundant in flour (140-16); in dead stem of ganduli, *Cajanus cajan*, at Rincón (110-15); in upright dead tree at Vega Alta (170-15).

**Rhizopertha pusilla** Fabricius

Leng & Mutchler 17-207: "Cosmopolitan species or introduced from the United States in timber."

**Apate francisca** Fabricius

(as *Apate carmelita* Fabr.) Stahl. Gundlach, "Es dañino a los árboles, perforando la larva, los troncos y ramas."

(as *Apate monachus* Fabr.) Van Z. (24), a borer in branches of pomelo, citron, *Cajanus cajan*, chinaberry, *Linociera domingensis*, *Salix humboltiana* and coffee.

Van Zwaluwenburg 16-44: "very numerous about Mayagüez and during the past year (1915) has been repeatedly found boring in young mahogany trees. The young stages have been found only in dead trees, but the work of the adults so weakens the trees that they are easily broken in a heavy wind."

Van Zwaluwenburg 17-516: "A living coffee tree may have as many as thirteen adults working in its trunk, and still survive, unless broken over by wind." Additional hosts: grapefruit and dry posts of "palo de hueso", *Picramnia pentandra*.

Smyth 19-139: "rarely riddles the standing stalks" of sugar cane.

Wolcott, G. N., "El Caculo Taladrador del Tallo del Cafeto", Circular 48, Insular Experiment Station, Río Piedras, P. R., October, 1921, pp. 2, fig. 2.

at light (256-13), at Guánica (688-13); boring in small tree of flamboyant. *Poinciana regia* (244-12 det. Schwarz); boring in coffee trees at Sabana Grande (323-21); boring in stalk of sugar cane at Limón, (H. Bourne, collector) 30 adults in one stalk (Photographs Nos. 497 & 500).

**Tetrapriocera tridens** Fabricius

Leng & Mutchler.

(as *Xylopertha longicornis* Oliv.) Gundlach.

at light at Guánica, July to October, most abundant in early October (589-13 det. Schwarz).

**Heterarthron gonager** Fabricius

Leng & Mutchler 14-453: from Mona Island.

from algarroba, *Prosopis juliflora*, at Guánica (548-13, 689-13 det. Fischer).

**Zylomeira torquata** Fabricius

(as *Xylomeira*) Leng & Mutchler.

larvae abundant in dead branch of leguminous tree at Coamo (133-23 det. Fisher).

LYCTIDÆ.

**Lyctoxolon japonicum** Reitter—det. Schwarz

at light in great numbers, breeding in native clothes basket (17-21), parasitized by Pteromalid wasps, probably *Neocato-laccus* sp. det. Rohwer; in branch of leguminous tree at Coamo (134-23).

CISIDÆ.

**Ennearthron delicatulum** Jacq. Duval

Gundlach.

SCARABÆIDÆ.

**Aphodius granarius** Linnaeus

Merrill 15-54: in fresh cow manure.

Leng & Mutchler 17-208: "var. undescribed."

in fresh cow manure at Guánica (540-13).

**Aphodius lividus** Olivier

Merrill 15-54: in fresh cow dung.

Wetmore 16-61: eaten by Ani.

in filter-press cake or cachaza (40-12); in cow dung at Guánica (470-13, 538-13).

**Ataenius gracilis** Melsheimer

Leng & Mutchler.

Wetmore 16-22, 66: eaten by Green Heron and Tody.

**Ataenius imbricatus** Melsheimer

Leng & Mutchler 17-208.

**Ataenius marginatus** Fabricius—det. Schwarz

at light at Pt. Cangrejos (April, 1920, GNW); in cow dung at Arecibo (311-22), at Guánica (471-13).

**Ataenius rhyticephalus** Chevrolat

(as *Auperia*) Gundlach.

**Ataenius stercorator** Fabricius

(as *Auperia*) Gundlach.

Merrill 15-54: in fresh cow manure.

Leng & Mutchler 17-208.

Wetmore 16-39, 61, 69, 91, 98: eaten by Killdeer, Ani, Owl, Mockingbird and Vireo.

Wolcott 22d-18: "during the periods of least rainfall on the south side the beetles *Aphodius lividus* Oliv. and *Ataenius stercorator* Fabr. become very abundant and by feeding on and tunneling through the fresh manure change it to a dusty, felty mass of undigested fibers."

in decaying cane seed (751-14), at Loíza (25-11), at Fajardo (231-12), at Aguirre around roots of cane growing in "poyal" land (590-12 det. Schwarz); in old straw (36-12), in filter-press cake or cachaza (39-12, 3-21); under bark of rotten tree at Bayamón (511-17); in cow dung (602-12), at Arecibo (310-22), at Guánica (539-13, 472-13, 555-13); at light at Pt. Cangrejos (GNW), at Guánica (611-13).

**Ataenius terminalis** Chevrolat

Leng & Mutchler.

(as sp.) Wetmore 16-63, 66: eaten by Woodpecker and Tody.

**Psammobius gracilis** Jacq. Duval

(as *Psammodius*) Stahl. Gundlach, "Viene por las noches a las velas de las casas."

**Trox suberosus** Fabricius

(as *T. crenatus* Oliv.) Stahl. Gundlach.

attacking sugar cane, according to Mr. C. T. Murphy, at Guánica (398-12 det. Schwarz as *Trox punctatus* Germar); under dead rat (802-14); at light at Pt. Cangrejos (GNW), at Humacao (57-13), at Guánica (573-13).

**Phyllophaga (Lachnosterna) vandinei** Smyth, E. G., 17-68; TYPE from Guánica, Porto Rico: "Its habitat is restricted to the western end (of the Island of Porto Rico), its farthest east recorded occurrence being at Manatí on the north coast and at Peñuelas on the south." Larvae feed on roots of plants, especially sugar cane, adults on leaves of sugar cane and many trees (see Smyth 17-79). Length of egg stage 14 days, 1st. instar larva 36 days, 2nd. instar larva 47 days, 3rd. instar larva 183 days, pupa 21 days; total life-cycle approximately



one year, but with two periods of maximum abundance of adults, late April and late August (at Guánica), and a very few present from September to March.

Cotton, R. T. "Experimental Work on the Control of the White Grubs of Porto Rico." Jour. Dept. Agr. P. R., Vol. 2, No. 1, pp. 1-18, January 1918: unsuccessful attempts at control.

Cotton, R. T. "Medios para Combatir los Gusanos Blancos." Circ. No. 12, Insular Experiment Station, Río Piedras, pp. 3-7, 1918, fig. 1 and 2: the practical methods of control.

Redescribed by J. D. More. Oblong, convex, broader behind, pale chestnut on elytra to dark reddish-brown on head, smooth and faintly shining in both sexes but not polished. Length 17 to 22 mm. Head rather coarsely and densely punctate except at base. Clypeus feebly emarginate, margin narrowly reflexed. Thorax less densely punctate with faint median flattening, distinctly narrower in front, sides obtusely angulate, widest a little to the rear of the middle, narrowed slightly towards base, more obliquely narrowed in front, lateral margins irregular, scarcely crenate, sparsely ciliate, posterior margin distinctly impressed on both sides. Elytral punctures somewhat finer than those of thorax, sutural costa well marked, with few sparse punctures and outer margin punctured, discal costa very feeble. Metasternum densely punctured and hair rather sparse. The posterior ventral margin of the fifth abdominal segment has a concavity or furrow with anteriorly a ridge sometimes faintly emarginate in middle. Pygidium shining, convex, lightly and sparsely punctate, posterior margin sharply reflexed and with a single row of long hairs. Antennae nine jointed. Last joint maxillary palpus elongate, moderately fusiform and slightly flattened. Anterior tibiae tridentate. Tibiae of hind pair of legs squarely truncate, subtriangular in cross-section bearing on the posterior inner angle a longitudinal row of from three to five stout, rather blunt spines and below each spine a long bristle; on the anterior inner angle a stout flattened spine opposite the more distal of the two small spines of the outer angle, bearing from one to three bristles, the distal one with three to five bristles; outer side with but few sparse punctures. Tarsal claws curved and strongly toothed in middle. *Male* with antennal club as long as the funiculus; last abdominal segment ventrally with extensive, sharply margined transverse concavity; both spurs slender, curved, movable, the larger about one third longer than the other. Genitalia with sheath (or "theca" of Smyth) collar-shaped, protractile, chitinous, open ventrally; adnate armatures distinct, chitinous and bifurcate at tip; spicula medial and sharply deflexed ventrally. *Female* with antennal club shorter than the funiculus; last abdominal segment ventrally broader, sparsely punctate and with slight non-margined concavity; pygidium more polished with two tubercles in apical

angle; spurs of rear tibiae much stouter and broadly machete-shaped; genitalia with prominent pubic process.

at Manatí (845-12, 226-12), Barceloneta (226A-16), Garrochales (241 & 242-16), Arecibo (145-16, 225-16), San Sebastián (436-13), Añasco (373-12, 1018-13), Hormigueros (817-15), Guánica (TYPE locality) and Yauco (very many records).

**Phyllophaga (Lachnosterna) portoricensis** Smyth, E. G., 17-145; TYPE from Río Piedras, Porto Rico: "The eastern analogue *P. vandinei* ----- its distribution -- approximately the eastern two-thirds of the Island." Has the same feeding habits as *P. vandinei* and one year cycle.

(as *Ancyloncha crenicollis* Blanchard) Stahl.

Wetmore 16-11: the "múcaro" or Bare Legged Owl, *Gymnasio n. nudipes* is the most important bird feeding on the adults, as they constituted 24.4% of its stomach contents, the Mozambique, *Holoquiscalus brachypterus*, feeds on the grubs (1.61% of the stomach contents) and the Little Blue Heron on adults (1% of stomach contents).

Redescribed by J. D. More. Much the same as the preceding species, but is usually somewhat greater in size, averaging 1 to 2 mm. more in length, is darker in color, the surface typically somewhat more polished. The male genitalia having the adnate armatures spatulate at the tip instead of bifurcate; spicula roundly deflexed ventrally instead of sharply. The pygidium of the female with the two tubercles in the apical angle often faint or absent.

at Fortuna (366-13), Aguirre (515-12, 380-13), Santa Isabel (943-13), Humacao (101-15), Fajardo (463-12), Vieques Island (67-17-"somewhat larger and lighter in color"), Luquillo (198-13, 945-13), Mameyes (176-13), Río Piedras (many records-TYPE locality), San Vicente (99-15, 225-15).

**Phyllophaga (Lachnosterna) citri** Smyth, E. G., 17-159; TYPE from Río Piedras, Porto Rico: One year life cycle, grubs often abundant in sandy land of north coast, feeding on roots of citrus trees, adults feed on leaves of citrus, rose, *Psidium guajava*, *Grevillea robusta*, *Acalypha wilkesiana*, *Miconia racemosa*, *Clidemia hirta*, *Lantana camara*, *Triumphetta* sp., *Urena lobata*, and others which are eaten by *P. vandinei* and *P. portoricensis*.

Redescribed by J. D. More. Oblong, convex, broader behind. Male dull brown, elytra with plumbeous bloom, female with less bloom, posterior half of elytra polished chestnut brown; thorax rich mahogany brown; head darker. Length 14 to 17 mm. Head rather coarsely and densely punctate except at base. Clypeus feebly emarginate, margin narrowly reflexed. Thorax less densely punctate, convex, distinctly narrower in front, sides obtusely angulate, widest a little to the rear of the mid-

dle, narrowed slightly towards base, more obliquely narrowed in front, anterior margin ciliate, lateral margins anteriorly crenate and ciliate, posteriorly entire and cilia lacking, posterior margin entire. Elytra punctured as densely as thorax, finely and scarcely pubescent, sutural costa well marked and punctured, discal costae nearly obliterated or wanting. Metasternum more coarsely and not so densely punctured as in *vandinei*, hair rather sparse. Posterial ventral margin of the fifth abdominal segment as in *vandinei*. Pygidium dull, densely and closely punctate, finely and scarcely pubescent. Antennae nine jointed. Last joint maxillary palpus elongate, moderately fusiform and slightly flattened. Anterior tibiae tridentate. Tibiae of hind pair of legs squarely truncate, moderately coarsely but scarcely punctured on the outside, spines as in *vandinei*. Tarsal claws curved and strongly toothed in the middle. *Male* with antennal club as long as the funiculus; last abdominal segment ventrally with a transverse impression extending to the lateral angle, granulate and somewhat narrowed medially; spurs movable, of nearly equal length, slender, blunt and curved. Genitalia with sheath collar-shaped, protractile, chitinous and open ventrally; adnate armatures fused into single spatha, spatha depressed, chitinous and polished above, unsymmetrical, hooked upwards on the left side and terminating in a serrate edge; spicula dextral. *Female* with antennal club shorter than the funiculus; last abdominal segment ventrally broader with slight transverse impression, granulate with smooth polished anterior and posterior margins; smaller hind tibial spur curved, usually broader and blunter and of uniform width; genitalia without prominent pubic process.

at Aguirre (304-15), Aibonito (1304-13), Maneyes (817-12), Vieques Island (68-17), Río Piedras (many records-TYPE locality), Vega Alta (339-17), Barceloneta (227A-16), Garrochales (242-16, 247-16), Arecibo (146-16, 225A-16), Aguadilla (448-13) and Añasco (372-12, 1008-13).

**Phyllophaga (Lachnosterna) guanicana** Smyth, E. G., 17-152: TYPE from Guánica, Porto Rico: adults from February to July, with maximum abundance of beetles in late April, feeding on leaves of *Lantana camara*, *Cordia cylindrostacha*, *Bucida buceras*, *Psidium guajava* and *Hamelia* sp., grubs feed on grass roots in upland pastures.

Redescribed by J. D. More. Similar in general appearance to *citri*. Elytra of the female polished chestnut brown with sometimes a trace of bloom. Length 13 to 17 mm. Elytra sparsely ciliate becoming more dense along the lateral margins. Pygidium densely but not closely ciliate. *Male* with adnate armatures of genitalia fused into single spatha, spatha thicker vertically than horizontally, bilaterally symmetrical, fleshy with

the exception of the two rows of minute, prostrate spinules on the dorsal and ventral surfaces.

at Guánica and Yauco (TYPE localities—many records).

**Phyllophaga crinitissima** sp. nov.

Described by J. D. More. Oblong, cylindrical, almost uniformly dull brown in color with margins slightly lighter, elytra posteriorly and laterally covered with a slight bloom and few short cilia. Length 9 mm. Head coarsely and densely punctate except at base. Clypeus feebly emarginate, margin narrowly reflexed. Thorax not so densely or coarsely punctured as head, distinctly narrower in front, convex, sides obtusely angulate, widest a little to rear of the middle, rather *densely covered with long cilia*; lateral margins scarcely crenate, ciliate with long hairs; disc with few long hairs. Elytral punctures somewhat finer than those of thorax; sutural costa well marked, margins punctate except inner at base. Metasternum densely and coarsely punctate, covered with long hairs. Abdomen with posterior ventral margin of fifth segment as in *vandine*i; last segment ventrally as in *citri*. Hairs on legs and ventral side of body very long. Pygidium dull, with slight bloom, punctured as thorax, posterior margin reflexed and with a single row of long hairs. Antennae nine jointed, club as long as funiculus. Last joint of maxillary palpus elongate, fusiform and slightly flattened. Anterior tibiae tridentate. Tibiae of hind pair of legs with spine arrangement as in *vandine*i, outer side with few punctures. Spurs movable, the larger about one-third longer than the other, slender, smaller spur slightly curved. Tooth of tarsal claw wanting (this character might be taken for the formation of a new genus). Described from a single male (83-16) at light at Pt. Cangrejos, P. R., Feb. 2, 1916, G. N. Wolcott coll. Female unknown.

**Phytalus apicalis** Blanchard—det. F. S. Arrow

(as *Phytalus insularis* Smyth, E. G., 17-163; TYPE from Guánica, Porto Rico): on *Amaranthus* spp. and *Panicum barbinode*.

(as *Phytalus insularis* Smyth) Wolcott 22d-14: third instar larvae as host of *Elis haemorrhoidalis* Fabr.

at light (183-15, 643-16, 113-12, 20-18); (943-16, 5-21), at Aibonito (922-15): at Garrochales on *Lantana involucrata* (241B-16); at Pt. Cangrejos on *Phyllanthus nivosus* Bull. var. *roseopictus* (GNW); at Guánica (many records).

**Dyscinetus barbatus** Fabricius

(as *Chalepus*) Stahl. Gundlach.

Van Z. (316) on sugar cane.

Smyth 16-47: life history summary.

common at light on north side of the island (77-11 det. Schwarz, 198-11, 610-12, 279-13, 459-13, 63-19), at Caguas

(SSC), at Ciales (653-21), at Añasco (509-13); rare at Guánica (1056-13, 332-15). Larvae feed on decaying vegetation in soil.

### **Dyscinetus trachypygus** Burmeister

(as *Chalepus picipes* Burm.) Gundlach.

(also as *D. picipes* Burm., not in synonymy) Leng & Mutchler 17-208.

Van Z. (316) on roots of "malojillo", *Panicum barbinode*.

Smyth 16-47: life history summary.

Smyth 19-120: adults feeding on roots of sugar cane at Carolina.

common at light (611-12 det. Schwarz, 746-14, 64-19, 435A-19, 368-22), at Carolina (708-17), at Mameyes (202-13), at Humacao (60-13), at Barceloneta (465-13), at Arecibo (95-13, 148-16), at Guánica (506-13, 1055-13, 1685-13, 221-15).

### **Ligyryus tumulosus** Burmeister

(as *Ligyryus fossulatus* Latr. det. Chevrolat) Gundlach.

Leng & Mutchler. Van Z. (318) on roots of sugar cane.

Smyth 16-47: life history summary.

	Egg	Larva			Pupa	Total
		1st instar	2d instar	3d instar		
<i>Dyscinetus barbatus</i> -----	13 days	19 days	28 days	59 days	15 days—	144 days
<i>Dyscinetus trachypygus</i> ---	12 days	22 days	15 days	44 days	13 days—	104 days
<i>Ligyryus tumulosus</i> -----	13 days	13 days	15 days	27 days	14 days—	77 days

The grubs usually feed on decaying vegetation in sandy soil, especially cane stalks, but injury to live roots is accidental. The adults sometimes bore into the base of live cane stalks.

Wolcott 21-43: "1% of 50,000 stalks of cane examined" thus injured, at Vega Baja, Barceloneta, Camuy, Yabucoa, Humacao and Guayanilla.

at light (3-13, 271-13, 3-19), at San Juan (35-11), at Manatí (174-15), at Barceloneta (464-13), at Arecibo (96-13, 147-16), at Guánica (46-10, 21-13, 776-13); in soil around cane seedlings (484-12 det. Schwarz 743-12), in plowed land at Mameyes (818-12); larvae parasitized by *Campsomeris dorsata* Fabr., at Guánica, H. Bourne collector (491-13).

### **Strataegus quadrifoveatus** Palisot de Beauvois The Coconut Rhinoceros Beetle.

(as *S. laevipennis* Chevrolat) Stahl. Gundlach, "acaso nombre manuserito."

Leng & Mutchler. AMNH at Mayagüez.

Smyth 19-123: adults boring into stalks of sugar cane and young coconut palms.

Smyth, E. G., "The White Grubs Injuring Sugar Cane in Porto Rico, II, the Rhinoceros Beetles." Jour. Dept. Agr., P. R.,



Vol. 1, No. 2, April, 1920, pp. 1-31, pl. 4: an extended account of this and the following species.

Wolcott, G. N., & Seín, F., "Los Caculos Cornudos o los Escarabajos Rhinocerontes de Puerto Rico." Circ. 58, Insular Experiment Station, Río Piedras, P. R., 1922, pp. 1-13, pl. 4: a summary in Spanish of the paper by Smyth.

at light (133-11, 213-13, 104-15, 307-16, 868-16), at Aguirre (5-12), at Adjuntas (FS & GNW); injuring young coconut palm trees by burrowing into them below the soil (285-22), at Sabana Llana (108-18, 99A-18, 16-18, 401-19, 184-21), at Loíza Viejo (192-21), at Manatí (136-16); burrowing up into cane stalk (108-18, 520-19); larvae from soil around cane at Guánica (2-10); in filter-press cake or cachaza (14-21); in interior of rotten coconut palm at Loíza Viejo (259-16).

**Strataegus titanus** Fabricius The Sugar-Cane Rhinoceros Beetle.  
(as *Scaraboeus*) Ledru 1780.

Gundlach. Leng & Mutchler. AMNH at Martin Peña and Fajardo.

Van Dine 13-42: grubs eating cane roots at Guánica, Ponce, Fortuna, Santa Isabel and Aguirre on south coast.

at light (336-13, 449-13, 468-13, 123-15, 182-15); in rotten tree at Dorado (713-13); larvae at base of rotten fencepost (323-13); larvae from soil around cane roots, sometimes attacking live roots at Guánica (4-10), at Santa Isabel (85-11, 848-14), at Fortuna (929-13), on Vieques Island (69-17); larvae attacking seed cane at Guánica (GNW).

Grubs feed on rotten wood and roots and stumps of trees in the soil, old cane stalks and decaying cane seed, but attack live roots only when other sources of organic matter are lacking; the food of the adults "consists largely of the green parts of woody plants and young trees" (Smyth). One year life-cycle.

**Phileurus didymus** Linnaeus—det. Schwarz

in termite nest, *Nasutitermes morio* Latr., at Ciales (242B-16, 467-21); at Mayagüez (813), R. H. Zwaluwenburg, collector.

**Homophileurus quadrituberculatus** Palisot de Beauvois

(as *Phileurus*) Gundlach, "La larva vivió en el nido o bulto de *Termes morio*."

Leng & Mutchler.

#### LUCANIDÆ.

**Passalus pentaphyllus** Palisot de Beauvois

Ledru 1780. Stahl.

(several unlabeled specimens).



**Spasalus puncticollis** Serville(as *Passalus dentatus* Fabr.) Ledru 1780.(as *Passalus* sp.) Gundlach.

Leng &amp; Mutchler.

larvae and adults in rotten log at Yauco (308-21); at Mayagüez (617), R. H. Van Zwaluwenburg collector.

## CERAMBYCIDÆ.

**Parandra cribrata** Thomson

Leng &amp; Mutchler.

**Parandra cubaecola** Chevrolat

Leng &amp; Mutchler.

(as sp.) Wetmore 16-69: eaten by Owl.

**Stenodontes bituberculatus** Palisot de Beauvois(as *Nothopleurus*) Leng & Mutchler.in burrow of live guacima tree, *Guazuma guazuma*, at Salinas (76-16); unlabeled specimens probably from Guánica — det. W. S. Fisher.**Stenodontes damicornis** Linnaeus

Stahl.

**Stenodontes exsertus** Olivier

Leng &amp; Mutchler. Van Z. (P. R. 806).

**Stenodontes mandibularis** Fabricius

Stahl. Gundlach.

**Nothopleurus maxillosus** Drury(as *Malloodon*) Gundlach. Stahl.

Leng &amp; Mutchler 17-209: recorded by Gundlach.

**Callomegas protelarius** Lameere, A., Ann. Soc. Belgique, Vol. 48, p. 66, 1907, TYPE from Porto Rico.

Leng &amp; Mutchler.

resting on stump at Lares (332-21 det. Schwarz).

**Callomegas sericeus** Olivier(as *Orthomegas*) Stahl. Gundlach.

Leng &amp; Mutchler.

**Solenoptera thomae** Linnaeus = **Solenoptera lateralis** Chevrolat(as *S. lateralis* Chev.) Stahl. (as *Prosternodes*) Gundlach.

Leng &amp; Mutchler. AMNH at Aibonito. Van Z. (P. R. 20).

(as sp.) Wetmore 16-77: eaten by Kingbird.

(145-11, 796-14); on unidentified bush at Fajardo (181-16); on coffee trees or stumps in mountains north of Yauco (240-22); adult and many larvae, mostly small, but many half-grown, in small fence-posts, just under the bark, at Yauco 300-September, 1921); larva in rotten twig of achioté, *Bixa orellana*, at Lares, June 14, pupated July 20, adult Aug. 3, dead September 12 (230-21).

**Methia punctata** Leconte

Stahl. Gundlach.

**Methia necyaalea** Fabricius

Leng &amp; Mutchler.

**Chlorida festiva** Linnaeus

Stahl. Gundlach. Leng &amp; Mutchler.

Van Z. (1213), larvae bore in branches of mango.

Wetmore 16-61: eaten by Ani, *Crotophaga ani*.

common at light (190-11, 556-12 det. Schwarz, 566-12, 620-12, 486-13, 1086-16, 146-17), at Lares (415-22), at Añasco (509½-13), at Guánica (552-13), usually with Uropodid mite nymphs on the thorax.

**Eburia quadrimaculata** Linnaeus

Leng &amp; Mutchler.

(as sp.) Wetmore 16-58, 66, 82, 96, 98, 104, 114: eaten by Cuckoo, Tody, Flycatcher, Vieros, Adelaide's Warbler and Yellow-Shouldered Blackbird.

at Condado (80-11 det. Schwarz), several unlabeled specimens.

**Elaphidion irroratum** Linnaeus

(as *E. bidens* Oliv.) Stahl. Gundlach, "no lo creo igual *E. irroratum* L."

Leng &amp; Mutchler 17-209: recorded by Gundlach.

at light (479-16), at San Juan (32-14 det. Schwarz), at Guánica (1094-13, 188-15).

**Elaphidion cinereum** Olivier

Gundlach. (as *E. nanum* Fabr.) Leng & Mutchler 17-209: recorded by Gundlach.

at light at Humacaó (59-13), at Vega Baja (478-16), on Vieques Island (GNW). (Specimens from Haina, Santo Domingo determined by Dr. Schwarz as *E. cinereum* Oliv., by Mr. Fisher as *E. nanum* Fabr.)

**Elaphidion spinicorne** Drury

(? as *Hypermallus spinicornis* Oliv.) Stahl.

Gundlach. Leng &amp; Mutchler.

at light at Guánica (687-13 det. Schwarz), at Humacao (661-17), at Lares (114-22).

**Elaphidion tomentosum** Chevrolat

Leng &amp; Mutchler 17-209.

at Palo Seco (113-15), at Cayey (25-21 det. Schwarz), at Maricao (387-21).

**Heterachthes 4-maculatum** Fabricius—det. Schwarz

at light at Guánica (1076-13), at Lares (148-22), at Pt. Cangrejos (GNW — det. Fisher).

**Merostenus attenuatus** Chevrolat

(as *Lampromerus*) Gundlach.

Leng & Mutchler 17-209: recorded by Gundlach.

**Compsa** sp.

Wetmore 16-69, 82: eaten by Owl and Flycatcher.

**Cylindera flava** Fabricius

(as *Lampromerus pilicornis* Fabr.) Stahl. Gundlach.

Leng & Mutchler 17-209.

at light (91-23), at Condado (66-10 det. Schwarz), at Humacao (662-19), at Guánica (591-13).

**Acyphoderes abdominalis** Olivier.

(as *Odontocera*) Stahl. Gundlach.

Leng & Mutchler.

**Acyphoderes aurulenta** Kirby—det. G. E. Bryant

on leaves of *Psidium guajava* at Cayey (211-23).

**Euryscelis suturalis** Olivier—det. Fisher

at light at Aguirre (68-16).

**Neoclytus araeformis** Olivier

Stahl. Gundlach. Leng & Mutchler.

ovipositing in freshly-cut logs of *Inga vera* in the mountains north of Yauco (319- September 8, 1921 — det. Schwarz).

**Procha spinipennis** Chevrolat—det. Schwarz

(197-11, 905-14), at Pt. Cangrejos (GNW).

**Monochamus titillator** Fabricius

(as *Monohammus*) Gundlach.

**Lagochirus araeformis** Linnaeus

Stahl. Gundlach. Van Z. (P. R. 805).

at light (296-12, 401-17), at Condado (36-11 det. by Dr. Schwarz as *L. obsoletus* Thomson), at Yabucoa (64-13). (Specimens from Haina, Santo Domingo determined by Mr. Fisher as *L. araeformis* Linn.)

**Leptostylus sagittatus** Jacq. Duval

Gundlach. Leng & Mutchler.

(as sp.) Wetmore 16-59, 63, 66, 69, 82, 96, 98, 99, 104, 106, 108, 111: eaten by Cuckoo, Woodpecker, Tody, Owl, Flycatcher, Vieros, Redstart, Warblers and Honey Creeper.

(det. as sp. by Mr. Fisher) at light (181-21); on firewood at Lares (128-21); on *Inga vera* tree at Lares (230-22); in hotel at Mayagüez (32-22); larvae in rotten fence-post at Maricao (414-21), under bark of stump at Dorado (898-13).

**Lepturges guadeloupensis** Fleutiaux & Sallé—det. G. E. BryantWetmore 16-66: eaten by Tody, *Todus mexicanus*.in coffee grove at Ciales (220-22 det. Fisher as not being this species); at Vega Alta (GNW); reared from pods of aroma, *Acacia farnesiana* at Boquerón (150-23).**Oreodera lateralis** Olivier

Gundlach. Leng &amp; Mutchler.

**Probatius umbraticus** Jacq. Duval

Gundlach. Leng &amp; Mutchler.

**Spalacopsis filum** Klug

Gundlach. Leng &amp; Mutchler.

in coffee grove at San Sebastián (101-21 det. Schwarz).

## CHRYSOMELIDÆ.

**Lema confusa** Chevrolat

Stahl.

**Lema dorsalis** Olivier

Gundlach. Leng &amp; Mutchler. AMNH at Aibonito and Coamo. swept from grass (63-12 det. Schwarz, 80-12), at Caguas (RTC), at Boquerón (14-23).

**Lema nigripes** Weise, J., 85-144, TYPE from Porto Rico.

Gundlach. Leng &amp; Mutchler.

(as sp.) Wetmore 16-61, 66, 84, 108, 111: eaten by Ani, Tody, Wood Pewee, Black and White Warbler and Honey Creeper. swept from grass (62-12), at Cayey (125-16), at Caguas (RTC — det. Schwarz), at Aibonito (SSC), at Ciales (222-22).

**Lema poeyi** Lacordaire

Stahl.

**Lema placida** Lacordaire

Stahl.

**Lema polita** Lacordaire

Leng &amp; Mutchler.

elytra blue, elsewhere black, one specimen (390-12 det. Schwarz).

**Chlamys** sp.

Wetmore 16-108: eaten by Northern Parula Warbler.

**Pachybrachys mendicus** Weise, J., 85-183, TYPE from Porto Rico.

Gundlach. Leng &amp; Mutchler.

**Pachybrachys praetextatus** Suffrian

Leng &amp; Mutchler.

**Cryptocephalus krugi** Weise, J., 85-148, TYPE from Porto Rico.

Gundlach. Leng &amp; Mutchler.

**Cryptocephalus nigrocinctus** Suffrian,<sup>1</sup> C. G. L. E., in *Linnaea Ent.*, VI, 1852, p. 282, TYPE from Porto Rico.

(as *C. tristiculus* Weise, J., 85-147, TYPE from Porto Rico, not in synonymy) Gundlach. Leng & Mutchler.

Gundlach. Leng & Mutchler.

on grapefruit (283-16), at Vega Baja (535-16), at Mayagüez (121-23 R. C. Danforth collector); on sedge (476-16), on mangrove (250-23), on *Inga vera* (80-21); on *Inga laurina* at Lares (154-22); on *icaco*, *Chrysobalanus icaco*, at Pt. Salinas (51-23); on weeds at Comerío (757-13); on castor bean at Luquillo (97-16); on *Dalbergia hecastophyllum* at Algarrobo (195-22); on tobacco at Cayey (36-16); on *Carrisa* at Garrochales (411-16), at Vega Alta (111-17); at Aibonito on roses (107-15); on *Psidium guajava* at Juncos (155-16); on Humbolt's willow at Florida (53-21); on unidentified tree at Lares (265-22); on cotton at Algarrobo (195-22), at Quebradillas (220-21); at Aibonito (SSC); on sugar cane at Barceloneta (GNW).

**Cryptocephalus** spp. (probably mostly *C. nigrocinctus* Suffrian)

Wetmore 16-66 to 125: eaten by Tody, Kingbird, Petchary, Flycatcher, Wood Pewee, Swallow, Martin, Vieros, Redstart, five Warblers and Oriole.

**Cryptocephalus perspicax** Weise, J., 85-151, TYPE from Porto Rico. Gundlach. Leng & Mutchler.

bright yellow; prothorax and elytra light brown in color with large yellow spots: feeding on leaves of sea-grape, *Coccoloba uvifera*, at Quebradillas (309-22 det. Schwarz).

brown or piceous; prothorax and elytra darker: feeding

<sup>1</sup> Mr. Mutchler states (letter of April 18, 1923): "The species *tristiculus* has the thorax thickly and finely punctured with a few somewhat larger punctures intermixed, fairly shining, while in *nigrocinctus* the thorax is not mirror smooth but fairly thickly and very finely punctulate, shining. The original description of *nigrocinctus* also speaks about the pale mark on the central portion of the basal segment of the abdomen, there is no allusion to this spot in the description of *tristiculus*." After an examination of the extended series of specimens of the two supposed species, it was found that there was no constant relation between the smoothness and punctuation of the prothorax and the pale mark on the central portion of the basal segment of the abdomen, and also, all variations were found in the size and intensity of this mark, from a large pale spot occupying the entire central portion of the basal segment, light yellow in color, progressively becoming smaller and more restricted posteriorly and darker in color, dark yellow to reddish-brown, to its ultimate disappearance. From the data available, there appears to be no constant character of separation, and the two names refer to extreme variations of a single species.

On July 4, 1923, a series of thirty specimens (250-23), singly and in coitu, was collected on the leaves and terminal shoots of mangrove on the shores of Laguna San José, near Río Piedras. The twelve males are smaller and four are dull purplish-brown. Two of these have the pale spot on the first ventral segment of the abdomen well marked; it is dull in the third and indistinguishable in the fourth. It is generally well marked in the blue-green males, but one lacks it entirely. Of the eighteen females, which have a well-marked fovea on the fifth abdominal segment ventrally, three have no pale spot, three show it faintly and the remainder quite clearly.

on leaves of *Inga vera* (79-23), at Comerío (755-13); abundant, feeding on tender leaves of *Dalbergia hecastophyllum* at Pt. Salinas (125-23).

**Cryptocephalus polygrammus** Suffrian  
Leng & Mutchler.

**Cryptocephalus stolidus** Weise, J., 85-149, TYPE from Porto Rico.  
Gundlach. Leng & Mutchler.

**Cryptocephalus tortuosus** Suffrian  
Gundlach. Leng & Mutchler.

**Cryptocephalus viridipennis** Suffrian  
Leng & Mutchler 17-210.

**Diachus nothus** Weise, J., (as **Cryptocephalus**) 85-152, TYPE from Porto Rico.

(as *Cryptocephalus*) Gundlach, "No en Cuba, donde vive *C. pusio* Suffrian, que es muy parecido."

Leng & Mutchler.

(as *C. pusio*) Wetmore 16-66, 84, 87, 108, 111: eaten by Tody, Elainea, Cliff Swallow, Parula Warbler and Honey Creeper.

in grapefruit grove at Vega Baja (536-16 det. Schwarz); on tender growth of *Inga laurina* at Lares (168-22): possibly another species with more coarsely punctate elytra and lighter yellow in color, on *Inga vera* (81-21).

**Lamprosoma longifrons** Suffrian  
Gundlach. Leng & Mutchler.

**Noda** sp. or **Nodonota** sp.—det. Cotton  
bronze-black, shining, finely and evenly punctured, each puncture with a short white hair, antennae, tibiae and tarsi brown.  
on sagebrush, *Croton* spp., at Yauco (47-22), at Boquerón (95-23).

**Colaspis alcyonea** Suffrian  
Gundlach. Leng & Mutchler.  
(as sp. det. Schwarz) on El Yunque at Mameyes (809-12).

**Metachroma antennalis** Weise, J., 85-155, TYPE from Porto Rico.  
Gundlach. Leng & Mutchler.  
(as sp.) Wetmore 16-104, 108, 116: eaten by Warblers and Oriole.

reported as attacking cotton at Quebradillas in June (185-22 det. Dr. Schwarz and Mr. G. E. Bryant); between leaves and in spider nests on various plants on the beach at Arecibo (165-May 21, 1923).

**Metachroma liturata** Suffrian  
Wetmore 16-116: eaten by Oriole.



**Leucocera laevicollis** Weise, J., 85-156, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

on dwarf holly, *Malpighia coccigera*, in the woods at (Seboruco) Pt. Cangrejos (376-22 det. Schwarz, Alice Ames, collector); (235-22 Margaret Lord, collector).

**Myochrous armatus** Baly—det. G. E. Bryant

(as sp.) Wetmore 16-39, 61, 63, 82, 87, 96, 98, 106, 108, 111: eaten by Killdeer, Ani, Woodpecker, Flycatcher, Cliff Swallow, Vireos, Warblers and Honey Creeper.

on swamp vegetation at Boquerón (175-23).

**Galerucella obliterata** Olivier

Leng & Mutchler.

**Galerucella varicornis** Weise, J., 85-157, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

feeding on leaves of "moral", *Cordia sulcata*, at Mayagüez (253-23 det. Schwarz); on flowers of *Cordia corymbosa* at Sabana Llana (112-15).

**Diabrotica aeruginea** Fabricius

Leng & Mutchler.

**Diabrotica graminea** Baly, J. S., "Descriptions of Uncharacterized Species of *Diabrotica*" in Trans. Ent. Soc. London, pt. IV, December 1886, p. 443, TYPE from Porto Rico.

Leng & Mutchler.

Leng & Mutchler 17-211: from Vieques Island.

Van Z. (31) on beans, squash, sugar cane and *Erythrina glauca*.

Van Dine 13-34: on leaves of sugar cane.

Smyth 19-142: "adults feed to some extent on the foliage, and larvae upon the roots" of sugar cane.

Wolecott 21-45: sometimes abundant in cane fields.

Jones 15-5: "very common --- on leaves of sugar cane, --- injury most severe on corn and okra, --- on flowers of cowpeas, --- foliage of *Spondias lutea* and *Amaranthus spinosus*."

Cotton 16-96 to 98, fig. 3: life-history and control, hosts and technical description and illustrations of all stages.

Cotton 18-302: "attacks almost all vegetable crops, --- very abundant on okra, feeding on the petals, pollen and pistil of the flowers."

Wetmore 16-61, 66, 80, 128: eaten by Ani, Tody, Petchary and Grasshopper Sparrow.

at light at Guánica (588-13); on young leaves of sugar cane at Naguabo (32-10 det. Schwarz), on Vieques Island (GNW), at Humacao (55-13), at Yabucoa (401-12), at Juncos (8A-19), at Caguas in great abundance (GNW), at Toa Baja (141-13), at Vega Alta (81-13), at Arecibo (188-11, 12-15), at San Sebastián (GNW), at Yauco (240-21); on eggplant (44-16), on pistils of eggplant (53-16), on tomatoes (RTC), on corn

(638-17); on corn, cane and especially on beans at Aguadilla (24-22); on orange leaves at San Vicente (709-13); on fruit of *Solanum nigrum* at Luquillo (195-13); at Aibonito (SSC).

**Diabrotica bivittata** Fabricius

Stahl. Gundlach. (as *D. pallipes* Oliv.) Leng & Mutchler.

Van Z. (903a) on beans and cucurbits.

Jones 15-5: "in abundance on cucumber, squash, and melon, especially on the flowers."

Cotton 18-295: notes.

"smaller than *D. innuba*, legs entirely testaceous, elytral apices not dentate" Dr. Schwarz: on leaves of squash and cucumbers (395-12 det. Schwarz).

**Diabrotica innuba** Fabricius

Stahl. Gundlach. Leng & Mutchler. AMNH at Aibonito.

Leng & Mutchler 17-211 from Culebra Island.

Van Z. (903) on beans and squash. Jones 15-5: notes.

Cotton 18-294 to 295: "The beetles lay their small yellow eggs in the soil around the roots of the plants, and the larvae, which are slender, white, worm-like creatures, feed on and tunnel the roots."

"larger than *D. bivittata*, legs partly black, elytral apices dentate" Dr. Schwarz: on leaves of squash and cucumbers (22-12, 395-12 det. Schwarz), (640-17, 642-17), at Caguas (RTC), at Aibonito (SSC); on young leaves of sugar cane at Arecibo (14-15); on pokeweed, *Phytolacca decandra*, in the mountains north of Yauco (241-22).

**Diabrotica impressa** Suffrian

Stahl. Leng & Mutchler.

**Diabrotica quadriguttata** Olivier

Gundlach. Leng & Mutchler.

**Diabrotica thoracica** Fabricius

Stahl.

**Blepharida irrorata** Chevrolat

Gundlach. Leng & Mutchler.

**Cerotoma denticornis** Fabricius

Stahl. Gundlach.

(as *C. ruficornis* Oliv.) Leng & Mutchler. AMNH at Coamo, Aguadilla and Guayanilla.

Howard 04-84; Barrett 04-448: on beans and cowpeas.

Jones 15-5: "feeding on garden beans and cowpeas."

Van Z. (902) on beans and squash.

Cotton 18-275: notes and control.

Cotton 16-95 to 96, fig. 2: notes, life-history and control: illustrations of all stages.

abundant on cowpeas and beans (378-12 det. Schwarz, 71-

12, 81-12. 56-16, 138-16, "semi-immaculate adults occur about 1 to 5 of the normal form" 467-16), at Mayagüez (50-23), at Caguas (RTC: on sugar cane at Vega Baja and Guánica (GNW).

**Hypolampsis inornata** Jacoby—det. G. E. Bryant  
on swamp vegetation at Boquerón (186-23).

**Homophoeta aequinoctailis** Fabricius

Leng & Mutchler 17-211. (as *Oedionychis*) Stahl.  
abundant on *Heliotropium indicum* (74-12), at Caguas (124-16); at Boquerón (15-23 det. Schwarz), on Vieques Island (GNW—det. Schwarz); on grapefruit at Vega Baja (511-16); unlabeled specimen det. Mr. C. A. Frost.

**Oedionychis bicolor** Linnaeus

(as *Altica*) Ledru 1780.

Gundlach. Leng & Mutchler.

on unidentified shrub at Laguna San José, Pt. Cangrejos (319-22 det. Schwarz); very abundant on *Volkameria aculeata* at Pt. Salinas (124-March 17, 1923 det. Schwarz).

**Oedionychis cyanipennis** Fabricius

Stahl. Gundlach. Leng & Mutchler.

AMNH at Ponce, Tallaboa and San Juan.

Van Z. (P. R. 33) on young leaves of sugar cane.

on *Jussiaea erecta* and *J. suffruticosa*, "also on *Verbesina*, *Valerianoides*, *Pluchea*, *Physalis* and other plants, being general feeders" E. G. Smyth (464-16, 505-16), at Pt. Cangrejos (320-22), at Mayagüez (122-23 R. C. Danforth, collector), by the lagoon at Lajas (98-15); on leaves of sugar cane (212-11, 29-12 det. Schwarz), at Cayey and Guánica (GNW); on *Volkameria aculeata* at Boquerón (94-23).

**Oedionychis decemguttata** Fabricius

Gundlach. Leng & Mutchler.

**Omototus ferrugineus** Suffrian

Gundlach. Leng & Mutchler.

on tender growth of *Inga laurina* at Lares (166-22 det. Schwarz).

**Disonycha ambulans** Suffrian

Stahl.

**Disonycha chlorotica** Olivier

Stahl. Gundlach. Leng & Mutchler.

**Disonycha interstitialis** Suffrian

Gundlach. Leng & Mutchler.

feeding on roble, *Tecoma pentaphylla*, (427-12 det. Schwarz).

**Disonycha pallipes** Weise. J., 85-159. TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

**Disonycha laevigata** Jacoby—det. G. E. Bryant

Wolcott, G. N., "An Important New Pest of Beets in Porto Rico" in Jour. Ec. Ent., Vol. 16, No. 5, pp. 459-460, October, 1923.

bright orange-red; eyes, antennae except two basal segments, apical half of tibiae, and all of tarsi, black and finely pubescent; elytra bright green, shining, impunctate; on beets (375-22), on "beets, chard, eggplant and many other vegetables" at Mayagüez (120-23, R. E. Danforth collector); on *Amaranthus* at Guánica (242-21); in enormous numbers, resting on cane and beans at Guánica (39-23 det. Bryant); on *Philoxerus vermiculatus* at Hatillo (239-23).

**(Haltica apicaria** Mus. Berlin  
Stahl.)**Haltica gravidula** Suffrian

Gundlach. Leng & Mutchler.

possibly this species, about 3 mm. long, elytra very minutely punctured: millions of adults resting on leaves of tree on hill northeast of Guayama (50-January 23, 1922).

**Haltica jamaicensis** Fabricius

(as *Haltica plebeja* Oliv.) Gundlach.

(as sp.) Wetmore 16-39, 66, 87: eaten by Killdeer, Tody and Cliff Swallow.

Leng & Mutchler. AMNH at Aibonito and Coamo.

Cotton, R. T., "Life History of *Haltica jamaicensis* Fabr." Jour. Dept. Agr. P. R., Vol. 1, No. 3, July 1917, pp. 173-175: eggs, larvae and adults on *Jussiaea leptocarpa*, *J. suffricticosa* and *J. erecta*, sometimes adults feed on garden beans. Pupa in ground, 39 days from egg to adult, females lay 500 to 800 eggs.

on *Jussiaea* (41-12 det. as *H. plebeja* Oliv. by Dr. Schwarz, 153-13, 165-13, 167-13, 168-13), at Manatí (110-16), at Barceloneta (GNW), at Aibonito (SSC).

**Haltica occidentalis** Suffrian

Stahl. Gundlach. Leng & Mutchler.

at light at Guánica (571-13); on *Jussiaea* (250-12 det. Barber & Schwarz, 42-13, 438-17, 503-16), at Manatí (111-16); on leaves of sugar cane, presence probably accidental, at Toa Baja (142-13), at Guánica, Bayamón and on Vieques Island (GNW).

**Hermaphysa cylindrica** Weise, J., (as *Haltica*) 85-160, TYPE from Porto Rico.

Leng & Mutchler. (as *Haltica*) Gundlach.

very abundant on leaves of *Croton humilis*, *C. discolor* and other species of *Croton*, unevenly skeletonizing them, at Ponce (111-13 det. Schwarz), at Yauco (136-15, 48-22).

**Lactica scutellaris** Olivier

Gundlach. Leng & Mutchler.

swept from weeds (773-13, 475-16, 419-17); on *Trema micranthum* in mountains north of Yauco (321-21 det. R. T. Cotton).

**Lactica** sp.—det. Schwarz

black, legs and antennae brown, about 2 mm. long, on *Capseronia palustris* (579-12).

**Crepidodera asphaltina** Suffrian

Gundlach. Leng & Mutchler.

**(Crepidodera hirtipennis**

Stahl.)

**Homophyla krugii** Weise, J., 85-163, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

**Aedmon sericellum** Clark

Leng & Mutchler.

**Epitrix cucumeris** Harris The Black Flea-Beetle of Tobacco of Porto Rico. "La Pulga Negra" of tobacco-growers.

(as *E. fuscata* Jacq. Duval) Gundlach.

(also as *E. fuscata* J. Duval, recorded by Gundlach, not in synonymy) Leng & Mutchler 17-211.

Van Z. (1103) on tobacco leaves.

Jones 15-6: on eggplant, tomato and *Physalis*.

Merrill 16-50: on tobacco, control.

Cotton 18-310: on tomato.

Cotton 16-87: life-history, food-plants and control.

More, J. D., "Las Pulgas del Tabaco" Circ. 50, Insular Experiment Station, Río Piedras, P. R., October, 1921, pp. 1-8, fig. 3.

Wolcott 21-45: one on sugar cane at Aguadilla.

on *Physalis angulata* (201-12 det. Schwarz), on tomato (405-13); on potatoes at Jajome Alto (20-21); on tobacco at Aibonito (67-12, and SSC—det. Schwarz).

**Epitrix parvula** Fabricius

Gundlach. Leng & Mutchler.

Wetmore 16-87: eaten by Cliff Swallow.

Van Z. (1104) on tobacco.

Merrill 16-50: on tobacco, control.

Jones 15-6: on *Physalis*.

Cotton 16-88: food-plants, life-history and control.

Cotton 18-298: on eggplant.

More 21-6, fig. 2, a: notes.

Wolcott 21-45 abundant on sugar cane at Garrochales and Morovis.

on *Physalis angulata* (200-12 det. Schwarz); on tobacco at

Aibonito (SSC); "on *Cleome spinosa*, *Leptilon canadense*, *Lycopersicum esculentum*, *Solanum nigrum*, *Solanum torvum*, tomato and eggplant" R. T. Cotton.

**Chaetocnema apricaria** Suffrian

(as *Plectroscellis*) Stahl. Gundlach.

Leng & Mutchler.

Leng & Mutchler 17-212: from Vieques Island.

(as sp.) Wetmore 16-61, 106, 108: eaten by Ani, Yellow and Parula Warblers.

Jones 15-6: on sweet-potato and abundant on related weed.

on wild morning-glory (562-12 det. Schwarz); on sweet-potato at Comerío (765-13); abundant on *Ginoria rohrii* at Boquerón (173-22 det. Schwarz); making brownish curved slits in the underside of the leaves of mangrove at Mayagüez and at Martin Peña (GNW).

**Chaetocnema nana** Jacoby—det. G. E. Bryant

from grass growing on salty land at Salinas (244-21).

**Systema basalis** Jacq. Duval "La Pulga Americana" of tobacco-growers.

(as *Haltica basilea* Jacq.) Stahl.

Gundlach, "Ambos sexos difieren mucho." — or, more correctly, the sexes differ considerably from each other, the males are smaller and on each elytron have a broad median longitudinal golden band; the females have faint basal and apical spots on the elytra.

Howard 04-84; Barrett 04-448: on Russian sun-flower.

Leng & Mutchler. Van Z. (931) on beans, okra and beets.

Cotton 16-90 to 93, fig. 1: life-history, host-plants, control and illustrations of all stages.

More 21-5: same in Spanish.

Wolcott 21-45: abundant on sugar cane at Aguada, Aguadilla and San Sebastián in December, 1919.

Wetmore 16-39, 87, 106, 114, 119, 128: eaten by Killdeer, Cliff Swallow, Yellow Warbler, Yellow-Shouldered Blackbird, Mozambique and Grasshopper Sparrow.

on *Portulaca oleracea* (480-12 det. Schwarz, 481-12), on carrots and other vegetables (547-17), on tomatoes and eggplant (RTC), on *Valerianoides cayannensis*, *Verbesina alata*, *Pluchea* and *Borreria* (504-16); on *Lantana camara* and *Melochia* sp., abundant on *Pluchea odorata* at Cayey (249-21); on *Bidens pilosus leucanthus* and *Syndrella nodiflora* at Comerío (766-13); on tobacco at Aibonito (SSC); on corn, cane and especially on beans at Aguadilla (30-22); on sugar cane at Aguada and San Sebastián (GNW).

**Systema varia** Weise, J., 85-164, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

(as sp.) Wetmore 16-87: eaten by Cliff Swallow.



**Longitarsus (?) seminulum** Suffrian—det. G. E. Bryant  
on grass in saline waste at Salinas (245-27).

**Longitarsus varicornis** Suffrian  
Gundlach. Leng & Mutchler.  
very abundant on *Heliotropum indicum* (449-12 det. Schwarz,  
463-16), at Caguas (113-21).

**Glyptina** sp.  
Wetmore 16-66: eaten by Tody, *Todus mexicanus*.

**Phyllotreta fallax** Suffrian  
Gundlach. Leng & Mutchler.

**Phyllotreta guatemalensis** Jacoby—det. G. E. Bryant  
black or blue-black; prothorax and elytra dark blue, evenly  
and densely punctured; head dark blue-green, narrower than  
prothorax, which is not as wide as single elytron; length 2  
mm.  
abundant on *Cleome pentaphylla* at Mayagüez (123-Feb.  
11, 1923, R. E. Danforth collector).

**Aphthona compressa** Suffrian  
Gundlach. Leng & Mutchler. AMNH at Aibonito and on Dese-  
cheo Island.  
with blue elytra, on *Heteropterus laurifolia* (251-12 det.  
Schwarz); at Pt. Cangrejos (135-23), at Vega Baja (537-16),  
at Caguas (GNW); very abundant on *Volkameria aculeata*  
at Boquerón (84-23); one with purple elytra, on coffee at  
Utuado (474-21); another on *Inga laurina* at Mayagüez (252-  
23), these the true *A. compressa* det. G. E. Bryant.

**Aphthona maculipennis** Jacoby  
Leng & Mutchler 17-212.  
on *Phyllanthus lathyroides* (869-14 det. Schwarz).

**Megistops fictor** Weise, J., 85-162, TYPE from Porto Rico.  
Gundlach. Leng & Mutchler.

**Chalepus sanguinicollis** Linnaeus  
(as *Odontota axillaris* Dej.) Stahl. Gundlach.  
Leng & Mutchler.  
Leng & Mutchler 17-212: from Vieques Island.  
on weeds (474-16, 406-17), at Vega Baja (515-16 det. R.  
T. Cotton).

**Ochthispa loricata** Weise, J., 85-166, TYPE from Porto Rico.  
Gundlach. Leng & Mutchler.

**Mesomphalia exclamationis** Linnaeus  
Gundlach. Leng & Mutchler.  
(as sp.) Wetmore 16-59: eaten by Cuckoo.

**Chelymorpha argus** Lichtenstein, var. **geniculata** Dejean  
Gundlach. Leng & Mutchler. Cotton 18-309: on sweet-potato.

**Chelymorpha polysticha** Boheman  
Gundlach. Leng & Mutchler.  
on wild morning-glory, *Ipomoea* (835-14); on sugar cane  
at Juncos (659-17 det. Schwarz); on eggplant at Juncos  
(RTC).

**Coptocycla bisbinotata** Boheman  
Gundlach. Leng & Mutchler.

**Coptocycla glaucina** Boheman  
Leng & Mutchler.

**Coptocycla guttata** Olivier  
Stahl. Gundlach. Leng & Mutchler.  
(as *C. signifera*) Wetmore 16-61, 79, 87, 91, 114, 116, 128: eaten  
by Ani, Kingbird, Cliff Swallow, Mockingbird, Yellow-Shoul-  
dered Blackbird, Oriole and Grasshopper Sparrow.  
(as *Caprocyla signifera* Herbst) Jones 15-6: on sweet-potato.  
Cotton 18-307: on wild mornig-glory and sweet-potato leaves.  
on wild morning-glory at Caguas (102-16, 247-21), at Jun-  
cos (660-17); on sugar cane, accidentally, at Yauco (314-21).

MYLABRIDÆ (BRUCHIDÆ).

**Pachymerus giganteus** Chevrolat (**curvipes** Fabr. ?)  
Leng & Mutchler.

**Bruchus centromaculatus** Allard ( ? **cinerifer** Sch.)  
(as *B. cinerifer* (Chev.) Sch.) Gundlach, "se encuentra en la  
flor de Júcaro, *Terminalia*."  
Leng & Mutchler.

**Bruchus chinensis** Linnaeus  
Leng & Mutchler. Van Z. (1511) in stored cowpeas and beans.  
Wolcott 22b-5: notes.  
in dried cowpeas from Virginia at Ponce (335-19); at light  
at Guánica (593-13).

**Bruchus obtectus** Say  
Van Z. (1504) in beans. Wolcott 22b-5: notes.  
in beans (515-17), from Venezuela (155-17).

**Bruchus pectinicornis** Linnaeus  
Stahl.

**Bruchus livens** Suffrian—det. Schwarz  
on arrows of sugar cane (378-22).

**Bruchus pisorum** Linnaeus  
Wolcott 22b-5: notes.  
in peas from Spain (1029-16).

**Bruchus quadrimaculatus** Fabricius, var. **barbinicornis** Fabricius  
Leng & Mutchler. Wolcott 22b-5: notes.  
in peas from Georgia (135-11); in cowpeas (611-17), at  
San Juan (97-19), at Ponce from New York (336-19, 544-19).

**Mylabris rufimanus** Boheman—det. E. G. Smyth  
in broad beans from Spain (1031-16 — no specimens).

**Bruchus dominicanus** Jekel—det. G. E. Bryant  
(as *Bruchus* sp.) Wetmore 16-75: eaten by Jamaican Black  
Swift.  
from pods of algarroba, *Hymenia courbaril* (62-11); from  
pods of aroma, *Acacia farnesiana* at Guánica (42-14, 44-14),  
at Boquerón (110-23).

**Spermophagus pectoralis** Say  
Wolcott 22b-5: notes.  
in beans (151-17), from Venezuela (619-17).

**Zabrotes** sp.  
Wetmore 16-82, 84, 108: eaten by Flycatcher, Wood Pewee and  
Parula Warbler.

#### BRENTIDÆ (BRENTHIDÆ).

**Trachelizus linearis** Suffrian  
Gundlach, "debajo cortezas."  
(unlabeled specimens, entirely dull, dark brown, determined  
as sp. by Dr. Schwarz.)

**Belophorus maculatus** Olivier  
Leng & Mutchler. AMNH at Aibonito.  
on coffee leaf at Ciales (233-22 det. Schwarz).

**Belophorus militaris** Olivier  
Gundlach, "debajo de la corteza muerta".

**Brentus turbatus** Boheman  
Stahl. Gundlach. (as *Brentus nasutus* F.) Ledru 1780.

**Brentus volvulus** Fabricius—det. Schwarz  
under bark of decaying bucare tree, *Erythrina glauca*, at  
Cayey (166-16, 244-17, 357-22); under bark of mango tree  
at Añasco (508 $\frac{1}{2}$ -13); on coffee leaves at Yauco (143-  
21); at Corozal (136-22), at Aibonito (SSC).

#### PLATYSTOMIDÆ (ANTHRIBIDÆ).

**Brachytarsus** sp.—det. Schwarz  
from pods of *Acacia farnesiana* at Boquerón (138-23).

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- Wolcott, G. N.,**  
22a-1 to 20 "Vaquitas de Importancia Económica en Puerto Rico." Circ. No. 60, Insular Experiment Station, Río Piedras, P. R., pp. 1-20, fig. 20, October 1922.

***Attelabus coccolobae* sp. nov.**

Shining, robust; color, dark purplish-red, tending to become, especially in the male in more heavily chitinized portions, dark bronze-green. The basal half of the median and posterior femora light yellowish-brown, apical half in female and tarsi of both sexes light reddish-brown.

Beak near apex as broad or broader than head, even at base, narrowed from base to beyond insertion of antennae. Antennae, of male shorter than head, of female considerably longer than the head, with a few short, black hairs, two basal joints moniliform, the second the smaller, the next six joints elongated but gradually becoming more moniliform, the club, apparently 4-jointed, densely and finely pubescent, color of basal segment black, of terminal three light grey. Head elongate, especially in the female and almost as broad behind the eyes as at base, somewhat tapering and shorter in the male; wrinkled and pitted in front, a deep furrow between the prominent black eyes, terminating in the lobe overhanging the insertion of the antennae; finely transversely reticulate beneath and at base. Thorax roughly transversely rugose and somewhat pitted, the anterior, comparatively smooth but somewhat pitted margin separated by a deep depression; a narrower and more irregular, doubly depressed posterior margin. Mesothorax and metathorax beneath more or less roughly pitted, the abdomen beneath, and the pygidium also finely ciliate. Elytra with rows of large, deeply impressed, quadrangular punctures, becoming smaller and tending to coalesce into striae towards apex and along margins: a large, short, blunt tooth posterior of smooth area on humeri.

Anterior coxae roughly punctate in front, smooth behind; the anterior femora smooth, shining, faintly reticulate, finely and scantily ciliate on inside, greatly dilated into a rounded club, more gently tapering towards base, with two large teeth on ventral margin, in the female the largest tooth, blunt and irregularly curved, is at the greatest circumference of the femora and inserted at right angles to the smaller sharper tooth near the apex, in the male they are smaller and approximately parallel, the apical tooth being the larger. Anterior tibiae of the female as long as the femora, scythe-shaped, with a blunt tooth at inner apex, a sharp curved claw at outer apex; of the male less curved except at base, but with bluntly-toothed inner margin. Length 5 to 6 mm.

Described from a pair, found feeding on tender leaves of sea-grape, *Coccoloba uvifera*, at Pt. Salinas, Jan. 4, 1923, Acc. 54-23.

Wolcott 22a-6: method of oviposition and notes.

on host at Pt. Salinas (231-16, 66-22, 54-23 TYPE, 127-23), at Pt. Cangrejos (398-22), at Algarrobo (198-22), at Isabela (207-21); at Humacao Playa (286-23).

**Attelabus sexmaculatus** Chevrolat 76-228, TYPE from Porto Rico.

Stahl, also as *A. aureolus* Klug, which Gundlach states occurs in Cuba, but not in Porto Rico.

Gundlach. Leng & Mutchler.

(as *A. bipustulosus* Jekel) — this is the determination by Dr. W. Dwight Pierce of apparently identical specimens from the same host.

Van Z. (P. R. 1024) on *Psidium guajava* and *Eucalyptus* sp. Leng & Mutchler 17-217.

Wolcott 22a-6, fig. 1: notes, figure of adult and parasitism of egg by *Poropoea attelaborum* Girault.

on *Psidium guajava* (330-16 det. Schwarz), at Trujillo Alto (GNW — det. Schwarz), at Aibonito (SSC), at Añasco (1040-13); on "almendro", *Terminalia catappa* (92-21).

**Cylas formicarius** Fabricius

Jones 15-6: on sweet potatoes. Cotton 18-308: notes.

Cotton, R. T., "*Cylas formicarius* Fabr. in Flight" in Jour. Ec. Ent., Vol. 9, No. 5, October, 1916, p. 516.

More, J. D., "La Vaquita o Piche de la Batata" Circular 34, Insular Experiment Station, Río Piedras, P. R., January 1921, pp. 1-7, pl. 1.

Wolcott 22a-7: notes and control, illustration of adult.

at light (114-12, 297-12, 315-12), in *Ipomoea* with tuberous root (584-12), in sweet potatoes (682A-17, 683A-17, 684A-17), at Las Cabezas (94-16), at Fajardo (93A-18, 94A-18), at Isabela (212-21).

**Apion subaeneum** Gerstaecker, Carl, E. A., "Beschreibung neuer Arten Apion" in Stett. Ent. Zeit., Vol. 15, pp. 234-261, 265-280, 1854, TYPE from Porto Rico.

Leng & Mutchler. Leng & Mutchler 17-218: "*Apion portoricum* Gerstaecker is a synonym of *subaeneum* Gerstaecker (Wagner, Mem. Soc. Belg. 1912, XIX, p. 36)." (as sp.) Wetmore 16-104: eaten by Adelaide's Warbler.

**Exophthalmodes roseipes** Chevrolat (as **Pachnaeus**) 76-227, TYPE from Porto Rico.

(as *Pachnaeus*) Stahl. Gundlach. Leng & Mutchler.

(as the "smaller orange-leaf weevil, or 'green bug'") Tower 11a-9: "In the San Juan district and near Arecibo---in sandy soils---January and February---eggs in clusters between the leaves---number 6 to 24---scarring fruit in in June, 1908---eating the orange leaves, especially the new growth."

Marshall 22-60: generic transfer to *Exophthalmodes*.

Wolcott 22a-18, fig. 19: a general account, figure of adult.

feeding on orange or grapefruit leaves (41-15), at Loíza (191-21), at Pt. Cangrejos (GNW), at (Isabela grove or Plantaje) Pt. Salinas (181-15 det. Marshall), at Vega Baja (496-16), at Espinosa (67-15), at Manatí (153-15, 146-20), at Dorado (70-22), at Santana (212-16), at Arecibo (153-15); on cotton at Isabela (159-21, 215-21); on *Inga vera* (86-21); on *Inga laurina* at Lares (153-21); on *Dalbergia hecastophyllum* and "moca", *Andira inermis*, at Algarrobo (197-22); on injured cotton boll at Loíza (379-22); on icaco, *Chrysobalanus icaco*, at Pt. Cangrejos (391-22); on *Conocarpus erectus* at Pt. Salinas (52-23); on tender leaves of sea-grape, *Coccoloba uvifera*, at Loíza (121-22), 1 mm. longer than the largest *E. roseipes* (10 mm.) and refusing to eat tender grapefruit leaves, but no apparent structural difference; abundant and of normal size on this host at Arecibo (359-23 det. Marshall).

**Compsus maricao** sp. nov., generic determination by Dr. Marshall.

Integument shining black, densely clothed, except for denuded areas and ridges, with light bluish-green scales, and in punctures and depressions on the thorax and elytra with a superior layer of yellowish-green scales.

Antennae, except club, with bluish-white pubescence and scattering longer white cilia, first and second segments of funiculus subequal in length, other five moniliform, club velvety dark brown. Scales densest on head about eyes, denuded at base and along medio-dorsal longitudinal ridge on rostrum. Rostrum narrowest at eyes, rectilinear at sides, nearly twice as long as broad. Prothorax longer than broad, sides parallel



from base to beyond middle, narrowed somewhat towards apex; above, broadly and deeply depressed, except anteriorly, the depression being about 2.8 mm. long and 1 mm. wide, non-denuded except for a medio-longitudinal line, and surrounded, except posteriorly, by a broad, denuded U-shaped ridge, a slighter and less denuded ridge beneath on each side, not reaching the apex. Elytra elongate oval, much broader at shoulders than the prothorax, almost parallel sided, with a slight concavity just posterior of the humerus, but mostly broadly convex, although again more sharply concave approaching the blunt, curved apical horns, the tips of which are .5 mm. apart. The median margins of the elytra, except towards the apex, and the two adjacent striae of punctures are depressed, also three double and one single, but forked near base, striae; the ridge opposite those on the dorsum of the thorax and that extending from the humerus are most broadly denuded. Abdomen with first, second, third and fourth combined and fifth segments, ventrally subequal in length. Tibiae and tarsi are pubescent.

Length 13 mm.: breadth at humeri 4.5mm.

Described from a single female from Maricao, P. R., Oct. 17, 1921, (388-21) which had laid eggs between coffee leaves. Holotype in the British Museum.

**Diaprepes capsicalis** Marshall 22-59 and 60, TYPE from Porto Rico:

"Integument black or piceous, fairly densely clothed above and below with brown or brownish-grey scaling, often with a coppery reflection; elytra with a pale dot about the middle of interval five. Length 8-12mm."

(as *Exophthalmodes*) Wolcott 22a-20: eating "fresas".

on weeds (830-14), on *Eupatorium odoratum* (340-16), eating pepper leaves (568-17, 596-17 TYPE); eating "fresas", the fruit of *Rubus rosaefolius* det. L. H. Bailey, at Jajome Alto (148-21), on ground under fresa bush at Jajome Alto (362-22).

**Diaprepes abbreviatus** Linnaeus—determined Dr. Guy A. K. Marshall, or

**Diaprepes spengleri** Linnaeus—determined Dr. W. Dwight Pierce.

(as *Prepodes doublieri* Guérin) Stahl.

(as *D. distinguendus* Boheman and *D. comma* Boheman, not in synonymy) Gundlach, after Chevrolat 76-227.

(as *D. distinguendus* Boheman, *D. comma* Boheman, and *Exophthalmus spengleri* Linnaeus, not in synonymy) Leng & Mutchler.

Pierce, W. Dwight, "Some Sugar Cane Root-Boring Weevils of the West Indies." Jour. Agr. Research, Vol. 4, No. 3, pp. 255-271, pl. 4, June 15, 1915: the "weevil root-borer" of sugar cane in Porto Rico as *D. spengleri* Linn., with three varieties, *abbreviatus* Olivier, *comma* Boheman and *spengleri*

Linn. Reviewed by Dr. Marshall in Rev. App. Ent., Vol. 3, 1915, p. 627: "It is to be regretted that the author has adopted the name *D. spengleri* for the destructive root-borer of sugar cane, seeing that *D. abbreviatus*, L., is not only the older and therefore more correct name, but is also in general use in the West Indies. The name *abbreviatus* should therefore be substituted for *spengleri*."

Marshall, G. A. K., "On New Neotropical Curculionidae" Ann. & Mag. Nat. Hist., Vol. 18, No. 108, December 1916, pp. 449-469: "The variety figured by Mr. Pierce as *D. comma*, Boh., is *D. doublieri*, Guer., the true *D. comma* occurring in Venezuela and Trinidad."

Jones, Thos. H., "The Sugar Cane Weevil Root Borer (*Diaprepes spengleri* Linn.)" Bull. 14, Insular Experiment Station, Río Piedras, P. R., April 14, 1915, pp. 1-19, figs. 11: an extended economic account.

Wolcott 22a-15 to 16, figs. 6: a short economic account, with illustrations of eggs and larva in injured cane (original) and of larva and the three varieties of the adult (after Pierce and with his nomenclature).

Wetmore 16-10: the adults constituted a considerable portion of the stomach contents of the following birds: Petchary 18.47%, Kingbird 17.19%, Flycatcher 11.22%, Mozambique 9.69%, Ani 7.09%, Owl 1.8%, Yellow-Shouldered Blackbird 1.72%, and had been eaten by ten other large birds.

(the varieties vary only in appearance, not in habits or economic importance, although *comma* or *doublieri* is less common than the others and, except in a few cases, will not be specified in the following records) at light (102-11, 89-15), on leaves of sugar cane (5-15, 6-15, 9-15, 27-15), at Mameyes (80-8-12), at Fajardo (128-11), on Vieques Island (GNW — var. *doublieri*), at Yabucoa (71-11, 40-2-12), at Maunabo (517-12), at Santa Isabel (90-11, 415-13), at Aguirre (99-11, 373-13, 786-13, 884-13), at Fortuna (114-11, 115-11), at Guánica (18-10, 331-13, 762-15, 790-15), at Añasco (365-12), at Arecibo (185-11), at Toa Baja (94-15); on grass (20-12), at Humacao (58-10), at Guánica (44-10, 503-13); on celery (61-17); on *Spondias lutea* or "jobo" (993-13, 994-13, 901-14, 97-15) at Luquillo (194-13), at Fajardo (38-15), at Yabucoa (100-15), at Santa Isabel (706A-13), at Arecibo (146-13, 17-15), at Manatí (62-15); on icaco, *Chrysobalanus icaco*, (70-5-13, 901-14, 88-15), at Pt. Cangrejos (26-15); on bucare, *Erythrina micropteryx*, (901-14), at Toa Baja (121-16); on *Ficus laevigata* at Palo Seco (230-16); on leaves of grapefruit (172-16) and on orange at Vega Baja (708-13); on *Cassia tora* (959 to 965-14, 849 to 851-14, 893 to 896-14, 524-16), at Arecibo (524-16); on *Cassia aeschynomene* (290-16); on *Psidium guajava* (899-14, 44-18), at Barceloneta (109-16); on *Persea gratissima* (720-17); on mustard at Bar-

celoneta (82-11): eating leaves and calyx of cotton at Garrochales (305-22); in mountains north of Yauco ovipositing between coffee leaves (384-21); on unidentified tree at Ciales (215-22); feeding on leaves of Humbolt's Willow at Aguadilla (225-22, var. *spengleri*, scales white, but with broad lateral vitta of bright pink or alizarine crimson); on *Mimosa ceroxylon* (643-12), at Dorado (714-13); on velvet beans (524-16), on *Amaranthus subspinosus* at Santa Isabel (418-13), at Salinas (32-15); on *Parthenium* sp. at Santa Isabel (418-13); on *Ricinus communis* at Guánica (503-13) and on following hosts listed by E. G. Smyth; *Guazuma guazuma*, *Tamarindus indicus*, *Melicocca bijuga*, *Acnistus arborescens*, *Schrankia portoricensis* and *Agati grandiflora*.

Larvae attacking roots of sugar cane (395-13), at Luquillo (944-13), at Aguirre (382-13), at Fortuna (364-13, 367-13, 384-13), at Santa Isabel (930-13). Eggs between leaves of sugar cane, and of grass at Santa Isabel (701-13, 847-14), of *Chrysobalanus icaco* (849-14), of *Spondias lutea* at Ponce (GNW).

**Prepodes quindecimpunctatus** Olivier (? another synonym of *D. abbreviatus*).

Stahl. Chevrolat 76-227. Gundlach. Leng & Mutchler.

**Lachnopus coffeae** Marshall 22-60 to 61, pl. 1, fig. 8; TYPE from Porto Rico: "Integument piceous, with legs, antennae and apex of rostrum reddish brown; clothed above and below with small, convex, shiny, subcircular or very shortly ovate, white scales --- mostly not contiguous --- the elytra usually with three very irregular transverse subdenuded patches. Length 5.5 --- 6.25 mm.; breadth 1.8 --- 2 mm."

Van Zwaluwenburg 17-515: "the coffee leaf weevil --- abundant during April and May, feeding on the leaves, blossom buds, and newly set berries --- one year life cycle --- eggs in flat masses of fifty or more between two overlapped leaves, larvae --- feed on roots. Adults also on *Vitex divaricata* --- a Chalcid (*Tetrastichus vaquitarum* Wole.) bred from egg cluster."

Wolcott 22a-16 to 19, 3 figs: a more extended account, illustrations of eggs, parasite and adult.

Wolcott 23-46: possibility of control by spraying with Arsenate of Lead, but ordinarily not justified on account of expense.

feeding on tender orange leaves at Pueblo Viejo (149-15), of grapefruit at Isabela Grove, (Plantaje) Pt. Salinas (31-16), at Barceloneta (12-19); on leaves of coffee (44-21 TYPE, 499-21, 416-21 lived in captivity over fifty days, some of the females laying about 30 eggs each, which hatched in ten to fourteen days), at San Sebastián (99-21), in mountains north of Yauco (301-21), between Adjuntas and Utuado (91-22, 269-22), at Ciales (459-21).

**Lachnopus coffeae**, var. **montanus** Marshall 22-61 to 62, fig. 1; TYPE of variety from mountains north of Yauco, Porto Rico: "This upland race differs from the typical coast form in being somewhat larger and having the legs markedly paler; the scales on the upper surface are much sparser and more evenly distributed, and they are also rather smaller and more nearly circular; most of them being very pale blue or bluish white; on the other hand the stripe of white scaling along the side of the sternum is much denser and more sharply defined. There appears, however, to be no reliable structural difference either in the external characters or in the male genitalia." Wolcott 22a-16, fig. 16: also at Adjuntas, illustration of adult showing white stripe of scaling along sternum.  
Wolcott 23-46: mention.

feeding on tender leaves of coffee in mountains north of Yauco (146-21 TYPE), between Adjuntas and Utuado (484-21, 91-22, 268-22).

**Lachnopus** spp. nov. (?)

Integument piceous to black, legs and antennae purplish-pink; entirely and evenly clothed with very small convex, shiny, subcircular scales, with no constant areas of denudation. Length 6-8 mm.

on tender leaves of *Rapanea ferruginea* in mountains north of Yauco, F. Seín collector (263-Aug. 23, 1922).

Integument light brown to piceous, legs and antennae light yellow to reddish-brown; body and legs, except tarsi, evenly and densely clothed in light yellow, subcircular scales; punctures of elytra devoid of scales. Length 8 mm.

on tender leaves of *Rapanea ferruginea* in mountains north of Yauco, F. Seín collector (264-Aug. 23, 1922).

**Lachnopus curvipes** Fabricius

Stahl. Chevrolat 76-227. Gundlach. Leng & Mutchler.

Wolcott 22a-20, fig. 20: notes, illustration of adult.

(as sp.—also probably includes *L. coffeae*) Wetmore 16-58 to 128: eaten by Cuckoo, Ani, Owl, Kingbird, Petchary, Flycatcher, Mockingbird, Vireo, Parula Warbler, Honey Creeper, Yellow-Shouldered Blackbird, Oriole, Mozambique, Tanager, Spindalis, Grossbeak, Grasshopper Sparrow.

on *Amaranthus spinosus* (168-16); on undetermined weeds at Dorado (718-13), at Vega Alta (173-15), at Barceloneta (146-15), at Arecibo (279-21), at Yauco (405A-14, 704-14, 315-21), at Guayanilla (402-21); on *Inga vera* at Comerío (756-13); on *Cordia cylindrostacha* at Yauco (521-13) and on *Croton* sp. at Yauco (42-22); on sea-grape, *Coccoloba uvifera* at Loíza (125-22); on *Dalbergia hecastophyllum* at Algarrobo (196-22); on *Waltheria americana* at Boquerón (19-23); on *Conocarpus erectus* at Pt. Salinas (53-23); eating calyx and hiding in cotton squares at Isabela (160-21, 216-

21), at Quebradillas (303-22), at Vega Baja (196-22); eating grapefruit leaves at Manatí (152-15), at Santana (211-16), at Vega Baja (496-16); eating leaves of *Cassia occidentalis* at Yabucoa Playa (287-23).

**Lachnopus trilineatus** Chevrolat 76-228, TYPE from Porto Rico. Gundlach. Leng & Mutchler.

**Lachnopus valgus** Fabricius (possibly a synonym of *curvipes*) Gundlach.

**Apodrusus argentatus** sp. nov.

Integument piceous to black, legs dark reddish-brown; except eyes, antennae, tarsi and punctures and striae of elytra, evenly and closely covered with small, subcircular, silvery scales, interspersed, scantily on head, more thickly on prothorax with black scales.

Antennae yellowish-brown, club darker; scape scantily, funiculus and club densely pubescent; first joint of funiculus large, dilated towards apex, longer than broad, second smaller, third smallest and moniliform, others gradually becoming larger to form club. Head longer than broad, flat between the eyes and with a sharply-defined, scaleless median furrow extending to epistome from near base; eyes elongate, longitudinal, coarsely faceted. Rostrum a little longer than head, tapering to apex; the scrobes deep and extending as far posteriorly as opposite the anterior margin of the eyes. Prothorax almost square, viewed from above, except for slight tapering in anterior quarter and slight dilation towards scutellum. Elytra narrowly oval, sides parallel about half way to apex, wider at shoulders than prothorax; intervals broadly convex and much broader than striae, scarcely a trace of a callosity at apex of interval five. Tenth stria entirely separate from the ninth, although close to it about middle. Usually a rather extensive patch of darker scales on the third elytral interval a little more than half way to apex, a larger one on the fifth interval somewhat anterior, the smallest one on the seventh a little posterior of that on the fifth and one on the ninth two-thirds the distance to the apex. Length 4—4.5 mm.: breadth 1.8—2 mm.

feeding on leaves of *Guaicum sanctum* at Guánica (703-14) and on *Colubrina colubrina* (EGS); on unidentified host at Aguirre (74-16); on *Dalbergia hecastophyllum* in large numbers at Boquerón (20-23), at Pt. Cangrejos (389-22 TYPE), at Pt. Salinas (126-23).

**Apodrusus wolcottii** Marshall 22-59, fig. 7, pl. 1; TYPE from Porto Rico: "Integument black or piceous, fairly closely covered above with small, nearly circular, pinkish bluff scales having a distinct coppery sheen; the elytra with sometimes an in-



definite narrow band of dark brown scales behind the middle between striae 3 and 6; the lower surface with coppery grey scaling along the sides of the sternum and venter, the median area with sparse short curved pale squamiform setae."

abundant feeding on *Inga vera* leaves (87-21 TYPE); resting on coffee leaves at Añasco (369-12), in the mountains north of Yauco (302-21), at Jajome Alto (372-21), at Maricao (389-21), at Manatí (GNW).

**Heilipus usutulatus** Olivier

Leng & Mutchler.

**Phyllotrox** sp.

Wetmore 16-111: eaten by "Reinita" or Honey Creeper, *Coe-reba portoricensis*.

**Derelomus albidus** Suffrian

Gundlach.

**Tychius** sp.

Wetmore 16-87: eaten by P. R. Cliff Swallow.

**Erodiscus** sp.

Wetmore 16-39: eaten by Antillean Killdeer.

**Anthonomus annulipes** Fischer 88-487, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

**Anthonomus dentipennis** Chevrolat 76-228, TYPE from Porto Rico.

Gundlach, with *A. krugii* Fischer in synonymy.

Leng & Mutchler.

**Anthonomus nigrovariegatus** Fischer 88-487, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

**Anthonomus pulicarius** Boheman

Leng & Mutchler.

(as sp.) Wetmore 16-84: eaten by Wood Pewee.

Van Zwaluwenburg 16-45: as "a very small, dark, long-snouted weevil in the flower buds of eggplant," notes and control.

Cotton 18-300: "Eggplant Bud weevil---feeds on leaves and breeds in the flower buds. Eggs---laid in young developing buds and the small white legless larvae develop within the bud, causing it to dry up and drop off."

on wild eggplant, *Solanum torvum*, (403-17), at Cayey (258-21).

**Peridinetus concentricus** Olivier

Chevrolat 76-229.

(as *P. signatus* Schönherr) Stahl. Gundlach, with *concentricus* in synonymy, and as *P. maculatus* Sturm, not in synonymy.



(and as *signatus* Rosenschoeld, not in synonymy) Leng & Mutchler.

(as *P. poeyi* Jacq. Duval) Leng & Mutchler 17-217. AMNH at Mayagüez.

(as *P. signatus* Rosen.) Van Z. (P. R. 36) on *Piper peltata*. Wolcott 22a-8, fig. 2: "el picudo del higuillo que al comer hace agujeros circulares en las hojas"; illustration of adult.

on *Piper peltatum*, "more abundant on *Piper medium*, make small round holes in leaves, larvae bore in stems of plants" at Vega Alta (40-17 R. T. Cotton); on *Piper medium* at Espinosa (104-21), at Corozal (456-21), at Loíza (119-22), at Cayey (286-22).

**Baris torquatus** Olivier A. G., "Entomologie" V, Paris, 1907, (83), p. 145, TYPE from Porto Rico.

(as *Baridius*) Stahl.

Chevrolat 76-229. Gundlach.

Leng & Mutchler. AMNH at San Juan and Mayagüez.

Wetmore 16-87, 119: eaten by Cliff Swallow and Mozambique.

Van Zwaluwenburg 16-43: notes and control.

Cotton 18-300: "Eggplant Stem Borer, --- a pest of both wild and cultivated eggplant. Adult feeds on foliage, larva bores in stem and branches---small, white, oval eggs in a crescentric slit in the stem." Wolcott 22a-8: mention.

on eggplant or *Solanum torvum* (349-12, 731-13, 169-16, 449-16, 504-16, 405-17, 77-21), at Arecibo (441-13), at Guánica (525-13), at Aibonito (SSC), at La Plata (68-12), at Juncos (RTC).

**Ampelogypter cissi** Marshall 22-70, pl. 1, fig. 6, TYPE from Porto Rico: "Color uniform dark steel-blue above, the head, rostrum and lower surface blue-black. Length 2 mm."

feeding on tender shoots of *Cissus sicyoides* (161-21 TYPE).

**Lecriops psidii** Marshall 22-69, fig. 4, pl. 1, TYPE from Porto Rico: "Integument red-brown; the head with a dense edging of pale buff scales between and behind the eyes; the prothorax clothed with rather sparse narrow brownish-yellow scales, --- the median stripe of dense broad white scales on the posterior half, --- the elytra fairly densely covered with mingled pale buff and whitish scales, with an ill-defined curved dark transverse band about the middle ---; the mesosternum, metasternum and abdomen uniformly covered with large subcontiguous white scales. Length 2mm.; breadth .9 mm."

(? 402-16), at Mayagüez (R. H. Van Zwaluwenburg, collector and "H. 1219 --- bred from mummied guava") (710-14 TYPE) from *Psidium guajava*.

**Hypocoeliodes** sp. nov.—det. Schwarz

larvae mining in leaves of *Portulaca* (482-12).

**Rhysematus** sp.

Wetmore 16-57, 59, 61: eaten by Cuckoos and Ani.

**Chalcodermus ebeninus** Boheman

Van Z. (1513) on cowpeas.

(as sp.) Wetmore 16-119: eaten by Mozambique.

on cowpeas (70-12, 377-12 det. Schwarz, 76-21); on cane at Arecibo (EGS).

**Chalcodermus pupillatus** Suffrian

Wetmore 16-119: eaten by Mozambique.

**Euscepes batatae** Waterhouse The "Scarabee" of Sweet Potatoes.

Van Z. (926) on sweet potatoes and pomelo rind.

Van Zwaluwenburg 15-35: notes and control.

Cotton 18-309: a short account.

Wolcott 22a-7, fig. 5: notes, control and figure of adult.

on sweet potatoes (142-16), at Mayagüez (777-14).

**Euscepes porcellus** Boheman, Carl H., in Schonherr's "Genera et Sp. Curculionidum" Vol. 8, pt. 1, Paris, 1844, p. 430, TYPE from Porto Rico.

Leng & Mutchler. Leng & Mutchler 17-217: "redescribed by Leconte under the name *Acalles longulus* (Champion, Biol. Cent. Amer., Col., IV, pt. 4, p. 496)."

Wetmore 16-87 to 128: eaten by Cliff Swallow, Vireo, Redstart, Ovenbird, three Warblers, Honey Creeper, Yellow-Shouldered Blackbird, Oriole, Mozambique, Grasshopper Sparrow.

probably this species: on *Psidium guajava* (281-12); on *Andira inermis* at Lares (53-22).

**Gastrocercus ritcheri** Fischer

Leng & Mutchler.

**Anchonus anguillicollis** Chevrolat 76-228, TYPE from Porto Rico.

Gundlach. Leng & Mutchler.

possibly this species: punctures on elytra alternating with elongated warts with erect reddish-brown elongate scales, prothorax, beak and legs consisting entirely of punctures: under loose bark of *Inga vera* at Cayey (364-22).

**Anchonus suillus** Fabricius

Gundlach. Marshall 22-62, fig. 3, pl. 1: note.

from decayed wood of castor bean, *Ricinus communis*, (232-21); from board on ground (368-21), at Guánica (614-14); from decayed fence post at Naguabo (34-10); at Mayagüez (R. H. Van Z.); eaten by lizzard, *Anolis cristatellus* (296-23).

**Cossonus canaliculatus** Fabricius

Leng & Mutchler.

**Cossonus impressus** Boheman

Leng & Mutchler 17-218: from Mona Island.

**Cossonus vulneratus** Illiger

Leng & Mutchler.

**Caulophilus lantinasus** Say

Chittenden, F. H., "The Broad-Nosed Grain Weevil" Bur. Ent. Bul. 96, pt. 2, March 31, 1911, pp. 19-24: "February 3, 1899, living beetles were found in about equal numbers with the rice weevil in shelled corn and chick-peas (garbanzos) purchased in a store by Mr. August Busck at Arroyo, Porto Rico." Wetmore 16-111: eaten by Honey Creeper.

**Caulophilus** sp.

Wetmore 16-73, 75, 87, 89, 111: eaten by a Flycatcher, Black Swift, Cliff Swallow, Martin and Honey Creeper.  
one adult, black but all of elytra reddish-brown; under bark of dead *Bursera simaruba* tree at Vega Baja (114-16); another with only basal third of elytra reddish-brown; on leaves of *Inga vera* at Cayey (317-17).

**Nanus uniformis** Boheman (in Schönherr)

Gundlach, "Se encuentra frecuentemente en la parte interior de una llagua de Palma real fresca." Leng & Mutchler.

**Metamasius hemipterus** Linnaeus The Rotten Stalk Borer of Sugar Cane.

(as *Sphenophorus sericeus* Latr.) Stahl. Gundlach, "en los troncos muertos de plátano (*Musa*)."

(as *Sphenophorus sexguttatus* Drury) Busck 00-89: injuring sugar cane.

Leng & Mutchler.

Van Z. (305) in sugar cane, coconut palm and *Lantana* sp.

Van Dine 11-55; Van Dine 12-22; Van Dine 13-256; Van Dine 13-33: injurious to sugar cane, but not a serious pest.

Wetmore 16-10: the adults constituted 5.44% of the stomach contents of the Mozambique, 5.3% of the Kingbird, 1.53% of the Petchary, and had been eaten by the Ani, Oriole and Yellow-Shouldered Blackbird.

Smyth 19-142: "sugar cane; dead or injured palm trunks; banana trunks (rarely). Adults sometimes attack fruit."

Wolcott 21-46: attacking injured cane, eggs very rarely laid in injury as small as *Diatraea* tunnel, usually in rat injured cane.

Wolcott 22-48; Wolcott 23-49: larvae in stems of live banana (at Jajome Alto).

Wolcott 22a-10, fig. 7: a short account and illustration of adult larvae, pupae and adults in or on sugar cane (23-11, 24-11, 61-11, 163-11, 164-11, 199-11, 133-12, 282-12, 350-12, 393-12, 156-13, 794-13), at Luquillo (191-13, 238-13), at Fajardo

(39-15), at Naguabo (27-14), at Patillas (167-12), at Santa Isabel (33-15), at Ponce (166-12), at Guánica (12-10, 13-11 det. Schwarz, 40-11, 236-11, 332-13, 485-13, 500-13, 519-13, 328-15, 363-15, 364-15, 367-15), at Arecibo (309-13), at Barceloneta (39-10), at Manatí (904-14), at Vega Alta (60-10), at Cayey (24-21); in rotting stem of royal palm tree at Arecibo (1066-16); on El Duque at Naguabo, 1600 ft. up (721-14), at Aibonito (SSC); larvae in standing banana stalk at Jajome Alto (31-21).

**Cosmopolites sordidus** Germar The Banana Root Borer.

Wolcott 22a-11, fig. 8: Wolcott 23-49: discovery, distribution in Porto Rico, life history and methods of control.

one larva from banana at Vega Alta, barrio Malvilla (439-21 the first record in Porto Rico, 628-21 determination confirmed by Dr. Marshall and R. T. Cotton, 547-22), at Corozal (491-21), at Cayey (182-22) and at the Experiment Station (173-22) Río Piedras, at Comerío (275-22), at Barros (?), at Toa Baja (59-23).

**Calendra (Calandra) linearis** Herbst

(as sp.) Wetmore 16-66: eaten by P. R. Tody, *Todus mexicanus*.

(as *Sitophilus*) Gundlach, "Come las semillas del tamarindo." in tamarind seed pods at Guánica (535-13, 543-14), at Loíza (345-21).

**Calendra (Calandra) oryzae** Linnaeus

(as *Sitophilus*) Stahl. Gundlach, "muy dañina por la destrucción de los granos del maíz."

Barrett 05-396: parasitized by *Pteromalus calandrae* Howard. Leng & Mutchler.

Leng & Mutchler 17-218: from Mona Island.

Van Z. (1501) in stored corn, beans, sweet potatoes.

Wetmore 16-96: eaten by Latimer's Vireo.

Wolcott 22a-9, fig. 6, and Wolcott 22b-6: notes, life history and control.

in rice (26-11), in corn (487-12, 434-17, 612-17), at Guánica (615-14) and on foliage of casuarina tree (411-14); under bark of *Erythrina glauca* tree at Cayey (316-17).

PLATYPOIDÆ.

**Platypus poeyi** Guérin

Gundlach, "Talandra la madera en dirección de la corteza al corazón."

**Platypus ratzenburgi** Chapuis—det. Hopkins

under bark of logs of *Inga vera* at Lares (133-21).

**Platypus rugulosus** Chapuis—det. Hopkins

at light at Mameyes (184-13).

**Platypus schaumii** Chapuis, F., "Monograph des Platypides." Mem. de la Soc. Royale des Sci. Liege, Vol. 20, p. 81, 1866, TYPE from Porto Rico.

Leng & Mutchler.

**Platypus subcostatus** Jacq. Duval  
Gundlach. Leng & Mutchler.

**Platypus** spp.

Wetmore 16-63, 66, 73, 75, 84, 87, 108, 111: eaten by Woodpecker, Tody, a Flycatcher, *Anthracothonax aurentus* (7.77% of stomach contents), Black Swift, Wood Pewee (8.86%), Cliff Swallow (41.6% of stomach contents), Parula and Black & White Warblers, Honey Creeper (1.55%).

#### SCOLYTIDÆ.

**Stephanoderes opacifrons** Hopkins  
Leng & Mutchler 17-219.

**Xyleborus affinis** Eichhoff  
Leng & Mutchler.

**Xyleborus ampicollis** Eichhoff  
Leng & Mutchler.

**Xyleborus confusus** Eichhoff  
Leng & Mutchler.

abundant under bark of dead bucare tree, *Erythrina glauca*, at Cayey (349-22 det. Hopkins); from coconut palm at Cabo Rojo (49-23 det. Hopkins), at San Lorenzo (10-21).

**Xyleborus ferrugineus** Fabricius  
Gundlach, "viene por la noche a las luces de las casas."

**Xyleborus inermis** Eichhoff  
Van Z. (P. R. 810).  
Wetmore 16-87, 111: eaten by Cliff Swallow and Honey Creeper.

**Xyleborus grenadensis** Hopkins  
Leng & Mutchler 17-220.

**Xyleborus torquatus** Eichhoff  
Leng & Mutchler.

**Xyleborus sacchari** Hopkins  
(as sp.) Van Dine 11-56; Van Dine 12-22; Van Dine 13-256;  
Van Dine 13-33; Smyth 19-142: all stages in rotten or dry sugar cane.  
Leng & Mutchler 17-220.

all stages in rotten or dry stalks of sugar cane (900-14, 56-23 det. Hopkins), at Caguas (21-10), at Vega Alta (62-

10), at Barceloneta (26-10), at Añasco (42-10), at Guánica (237-11, 130-12, 526-14), at Patillas (168-12), at Humacao (48-13), at Mameyes (183-13); from *Inga vera* at Patillas (16-21 det. Hopkins).

**Xyleborus** spp.

Wetmore 16-87, 106, 108, 111: eaten by Cliff Swallow, Yellow and Parula Warblers, Honey Creeper.

STREPSIPTERA.

**Stenocranophilus quadratus** Pierce, W. Dwight, "Description of Two New Species of Strepsiptera (Halcotophagidae) Parasitic on Sugar Cane Insects", Proc. Ent. Soc. Wash., Vol. 16, No. 3, September, 1914, pp. 126-129.

reared from *Saccharosydne saccharivora* Westw. on sugar cane (847-12 TYPE and 974-13).





## LEPIDOPTERA.

### LITERATURE.

- Dewitz, H. "Tagschmetterlinge von Portorico." Stettiner Ent. Zeit., Vol. 38, pp. 233-245, pl. 1, 1877.
- Dewitz, H. "Dämmerungs und Nachtfalter von Portorico." Mitteilungen des Münchner Ent. Vereines Vol. 1, pp. 91-96, pl. 1, 1877.
- Moschler, H. B. "Die Lepidopteren Fauna von Porto Rico." Abhandlungen der Seckenbergischen naturforschenden Gesellschaft pp. 69-360, 1889.

The original records in the following list of Lepidoptera are based mainly on material determined by Dr. Harrison G. Dyar and Mr. Wm. Schaus, in the Sphingidae by Mr. B. Preston Clark, and in the Microlepidoptera by Mr. August Busck. Dr. Dyar has also described a number of new species from material collected by entomologists at the Insular Station. To Mr. Schaus, the writer is more especially indebted for indicating the order of listing of species, many generic transfers and synonymies in the Hesperidae and from the Noctuidae to the Microlepidoptera, and to Mr. Busck for the same services in the Microlepidoptera.

### NYMPHALIDÆ.

#### **Anosia plexippus** Linnaeus

(as *Danaus archippus* Fabr.) Dewitz. Stahl.

(as *Danaus erippus* Cramer) Möschler. Gundlach, "La oruga se cria en la *Asclepias curassavica*."

Van Z. (2002) on *Asclepias* sp.

(158-12 det. Dyar), at Martin Peña (825-14), at Mameyes (339-92) on *Lantana* flowers; larvae on *Asclepias curassavica* (320-12), on the giant milkweed, *Calotropis procera*, at Yauco and Ponce (GNW).

#### **Lycorea cleobaea** Godart

Dewitz. Stahl. Möschler. Gundlach.

#### **Heliconius charitonius** Linnaeus

Dewitz. Stahl. Möschler. Gundlach, "Es notable por la costumbre que tienen todas las de una localidad de reunirse por la tarde y dormir una al lado de otra. La oruga se cria en especies del genero *Passiflora*."

Van Z (P. R. 1429).

(as *Apostraphia*) AMNH, at Aibonito.

in clearings in the woods at Mameyes (801-12), at Martin Peña (25-14), at Quebradillas (EGS), at Arecibo (GNW).

**Eueides cleobaea** Hübner

Dewitz. Stahl. Möschler. Gundlach, "La oruga se cria en especies del genero *Passiflora*."

**Colaenis delila** Fabricius

Dewitz. Stahl. Möschler. Gundlach, "La oruga se cria en las *Passiflores*."

**Colaenis julia** Fabricius

Van Z. (P. R. 1419). AMNH at Aibonito and Mayagüez. (666-12), at Martin Peña (23-14).

**Dione vanillae** Linnaeus

(as *Agraulis*) Dewitz. Stahl. Möschler. Gundlach, "La oruga se cria en las *Passifloras*."

Van Z. (P. R. 1427). AMNH at San Juan.

(884-14), larvae on *Passiflora* sp. (261-12, 700-16); adults at Mameyes on *Lantana* flowers (GNW).

**Euptoieta hegesia** Cramer

Dewitz. Stahl. Möschler. Gundlach, "La oruga se cria en la planta *Turnera ulmifolia*." AMNH at San Juan.

at Camuy (EGS), at Pt. Cangrejos (GNW).

**Melitaea pelops** Drury

Dewitz. Stahl. Möschler. Gundlach.

**Phyciodes anocaona** Herr. Sch.—det. Dyar.

on el Duque at Naguabo (730-14).

**Synchlœ tulita** Gundlach

Dewitz. Stahl.

(as *Coatlantona*) Möschler. Gundlach, "cerca de la costa." AMNH at Tallaboa.

**Hypanartia paullus** Fabricius

(as *Heurema*) Stahl.

(as *Euroma tecmesia* Hbn. or *Terias*) Dewitz.

Möschler. Gundlach.

Larvae on *Trema micranthum* at Ciales (495-21 adult det. Schaus) and in mountains north of Yauco (57-23). Head, either black, roughened with four kinds of cones; small black ones, medium-sized white or light-green ones, large light-green ones, darker at base and black at apex surrounding base of brown hair, and large black ones at top of head or, darker green than body, with no black cones, altho some of the largest are black at apex. On the eight anterior abdominal segments

are seven yellow, branched spines, often with apical half or two-thirds black or dark reddish-brown; four spines on the second and third thoracic and ninth abdominal; warts on the first thoracic. Body bright green below, with bluish-grey bloom above. Spiracles white with faint black margin. True legs opalescent reddish-brown. Prolegs covered with quite long white hairs.

Chrysalis, light green at first with whitish pubescence, later light bluish-grey; 6 golden spots dorsally, two on each of the anterior abdominal segments, with brownish prominences on those posterior along the median ridge. Two sharp horns on head; proboscis, legs, antennae and wing-veins outlined in darker green. Brown circle with yellow center anterior of the cremaster ventrally.

***Pyrameis cardui* Linnaeus**

Dewitz. Stahl. Möschler. Gundlach.  
at Cayey (GNW).

***Junonia coenia* Hübner**

Van Z. (P. R. 138).  
(658-12, 75-19).

***Junonia lavinia* Cramer**

Dewitz. Stahl. Möschler. Gundlach, "Esta especie varía mucho; pero no es igual a la *J. coenia*."  
(887-14).

***Junonia genoveva* Cramer**

Stahl. AMNH at San Juan.

(670-12), at Algarrobo (821-14); larvae on *Valerianoides jamaicensis* (692-16), on fog-fruit, *Lippia nodiflora*, at Pt. Cangrejos, in great abundance, March 1920 (GNW).

Larvae, black, spiny. Head shiny, deeply divided into two lobes, each with short spine. Body velvety, neck light chestnut in color, spines purplish, especially at base, the more ventral row short, yellow, black-tipped. Chrysalis, light and dark grey, spiny and elongate.

***Anartia jatrophae* Linnaeus**

Dewitz. Stahl. Möschler. Gundlach. Van Z. (P. R. 139).  
AMNH.

(104-12), at Algarrobo (820-14); larvae on water hyssop, *Bacopa monniera*, at Pt. Cangrejos, March 1920 (GNW).

Larvae black, spiny. Head shiny, with two large branched spines. Body with silvery spots, more abundant dorsally, warts on first segment, large branching spines on others. Chrysalis short and plump, light green or opaque greenish-purplish-black, with bloom.

**Eunica monima** Cramer

Dewitz. Stahl. Möschler. Gundlach.

adults abundant, with *E. tatila* H. S., along irrigation ditch and road to Tablon No. 13, Hda. Santa Rita, Guánica (729-July 13 to 17, 1915).

**Eunica tatila** Herr. Sch.

Dewitz. Stahl. Möschler. Gundlach.

at Guánica (729-15).

**Gynaecia dirce** Linnaeus

Dewitz. Stahl. Möschler. Gundlach, "La oruga vive debajo de hoja de *Cecropia*, comiendo las nervaciones gruesas."

Van Z. (P. R. 140).

**Didonis biblis** Fabricius

(as *D. hyperia* Cr. & *Biblis thadana* Fabr.) Stahl.

Möschler. Gundlach. AMNH at Tallaboa.

at Quebradillas (EGS), at Arecibo (GNW).

**Timetes chiron** Fabricius

Dewitz. Stahl. (as *Megalura*) Möschler. Gundlach, "La oruga se cría en la *Maclura tinctoria* y acaso en el *Xanthoxylum*. El insecto suele posarse encima del fango para chupar."

**Timetes petreus** Cramer

(as *Marpesia*) Dewitz. Stahl.

(as *Megalura peleus* Sulzer) Möschler. Gundlach.

two adults, one yellowish, one reddish, at Guánica (728-15).

**Anaea (Pyrrhanaea) morrisoni** Edwards

Van Z. (P. R. 1434).

**Anaea portia** Fabricius

Van Z. (P. R. 1413).

at Guánica (727-15), resting on corn at Aguadilla (28-22), at Ponce (135-13); larvae of *Croton* at Ponce, Guánica and Boquerón (GNW).

**(Ageronia ferentina** Godart

Gundlach states specimens were collected by Dr. Stahl in Bayamón, and by Mr. Sentenis "en el interior de la parte oriental," but it is not mentioned in Stahl's list. As it is very common in Santo Domingo, the Porto Rican record is possibly due to accidental temporary introduction by commerce, or by migration.)

**Victorina steneles** Linnaeus

Dewitz. Stahl. Möschler. Gundlach. Van Z. (P. R. 1416).

in mountains at Añasco (1005-13), in coconut grove at Pt. Cangrejos (GNW); larvae on *Blechnum brownei* in coffee grove at Lares (317-22).

Larval stage about twenty days. Fully-grown larva about 40 mm. long, 7 mm. broad. Head black, glistening, roughened with long black hairs, and two long black, knobbed and spined horns, 6 mm. long. Body velvety black, purplish or dark red at sutures, with four blackened spiny warts on first segment; four branched spines, orange-red or pink, on second and third segments; seven spines on each of the next seven segments, the more ventral ones shorter and all black, the next sometimes pink at base, the three dorsal rows always pink at base and arising from round orange spots, which are coalescent on the first three abdominal segments, but black-tipped, sometimes one-half or two-thirds black; eight spines on the eleventh segment and four arranged in a square on the final segment. True legs black and shiny, prolegs pinkish.

Chrysalis is 28 mm.  $\times$  10 mm., light green in color, covered with whitish bloom, head and wings transparent, suspended from a pinkish cushion of silk by black cremaster, 3.5 mm. long, black, divided at base. Two cephalic and one dorsal green horns, with slenderer black interior horns. Five pairs of pink spines on abdomen opposite the end of the wing-pads, besides twelve brighter pink spots anteriorly, and numerous smaller pink and black spots posteriorly. Pupal stage nine to ten days.

### **Hypolimnias misippus** Linnaeus

Stahl. (as *Diadema bolina* Linn.) Dewitz.

(as *Diadema*) Möschler. Gundlach.

male collected by Alan York at Cayey; females at Boquerón (29-23).

### **Heterochroa gelania** Godart

Möschler. Gundlach. (as *H. arecosa* Doubl. West.) Dewitz.  
Stahl.

### **Apatura idyja** Hübner

Gundlach. (as *Doxocopa*) Stahl.

### **Historis orion** Fabricius

(as *Aganisthos odius* Fabr.) Stahl. Gundlach, "La oruga se cria en la *Cecropia*."

(as *Aganisthos*) Dewitz.

larva on *Cecropia peltata* (164-20, adult det. Schaus). "Flattish, medium-gray, with white saddle 5 by 10 mm. at middle of back and two prominent projections, with spiny protuberances projecting upward and outward from the head, about 3 mm. long. In the fully-grown caterpillar the saddle was greyer and less conspicuous. The pupa, reddish-brown in color, had two double-curved projections 4 to 5 mm. long extending forward from the head and almost touching at their apex, but 2 mm. apart at base." E. G. Smyth.



**Historis acheronta** Fabricius

(as *Megistanis cadmus* Cr.) Dewitz. Stahl. (as *M. acheronta* Fabr.) Möschler. (as *Aganisthos*) Gundlach.

**Prepona antimache** Hübner

(as *P. amphitoe* God.) Stahl. Dewitz. Möschler. Gundlach.

**Paphia troglodyta** Fabricius

Dewitz. Stahl. Möschler. Gundlach.

**Siderone ide** Hübner

Dewitz. Stahl. Möschler. Gundlach.

SATYRIDÆ.

**Calisto nubila** Lathy, P. I., "Monograph of the Genus *Calisto* Hübner." Trans. Ent. Soc. London. Part 2, June 1899, pp. 221-228, pl. 1. TYPE from Porto Rico.

(as *Calisto zangis* Fabr.) Dewitz. Stahl. AMNH at Aibonito.

(as *Callisto zangis* Fabr.) Möschler. Gundlach. Van Z. (P. R. 1419).

(668-12, 808-14, 885-14), at Trujillo Alto (895-13 det. Dyar), on El Duque, Naguabo (734-14), in mountains north of Yauco (296-21).

LIBYTHEIDÆ.

**Libethea motya** Hübner

Dewitz. Stahl. Möschler. Gundlach.

LYCÆNIDÆ.

**Lycaena cassius** Cramer

Dewitz. Stahl. Möschler. Gundlach.  
at Camuy (EGS).

**Lycaena hanno** Hübner

Dewitz. Stahl. Möschler. Gundlach. Van Z. (P. R. 132).  
at Algarrobo (813-14).

**Lycaena marina** Reakirt—det. Schaus

at Camuy (EGS).

**Eupsyche telea** Hewitson

Dyar -36.

**Thecla acis** Drury

Dewitz. Möschler. Gundlach.  
at Ponce (137-13).

**Thecla angelia** Hewitson

Dewitz. Stahl. Möschler. Gundlach.

**Thecla caelebs** Herr. Sch.

Dewitz. Möschler. Gundlach, "La oruga come los botones de *Tetrapteris*."

**Thecla cardus** Hewitson  
Dewitz. Stahl. Möschler. Gundlach.

**Thecla cybira** Hewitson  
Dewitz. Möschler. Gundlach.

**Thecla celida** Hewitson  
Dewitz. Möschler. Gundlach.

**Thecla limenia** Hewitson  
Dewitz. Stahl. Möschler. Gundlach.

**Thecla maesites** Herr. Sch.  
Dewitz. Stahl. Möschler. Gundlach.

**Thecla telea** Hewitson  
Dewitz. Stahl. Möschler. Gundlach.

**Thecla simaethis** Drury  
Dewitz. Stahl. Möschler. Gundlach.

## PIERIDÆ.

**Leptalis (Dismorphia) spio** Godart  
Dewitz. Stahl. Möschler. Gundlach.  
in coffee grove at Añasco (1006-13), on El Duque near  
Naguabo (736-14), common in August on El Yunque near  
Mameyes (EGS).

**Pieris amarylis** Fabricius  
(as *P. josephina* God., var *krugii* Dewitz) Dewitz. Stahl.  
Möschler. Gundlach.

**Pieris joppe** Boisduval  
Dewitz. Stahl. Möschler. Gundlach.

**Pieris monuste** Linnaeus  
Dewitz. Stahl. Möschler. Gundlach, "Muy abundante y da-  
ñina, porque la oruga vive en las coles y otras plantas cruci-  
feras."  
Tower 08-35; on cabbage, raddish, turnip, kale and mustard.  
Jones 15-6; on horse radish and *Cleome spinosa*.  
Cotton 18-281; figures of egg, larvae and adult—on cabbage.  
(760-12, 22-18); larvae on raddish (145-12, 80-19), on  
turnip (222-12), on cabbage (634-17, 657-17); on *Cleome*  
*spinosa* at Canóvanas (291-13), at Carolina (30-15); on  
*Gynandropsis pentaphylla* (499-12, 514-12).

**Tachyris ilaire** Godart  
(as *T. margarita* Hbn.) Dewitz.  
(as *Pieris*) Stahl.  
(as *Daptonoura*) Möschler. Gundlach.  
(as *T. margarita* Hbn.) Van Z. (P. R. 134).

**Callidryas agarithe** Boisduval

Dewitz. Stahl. Möschler. Gundlach  
(as *Phoebis*) Van Z. (P. R. 1428).

**Callidryas (Catopsilia) argante** Fabricius

Dewitz. Stahl. Möschler. Gundlach.  
at Camuy (EGS).

**Callidryas (Catopsilia) eubule** Linnaeus

Dewitz. Stahl. Möschler. Gundlach, "La oruga se cría principalmente en la *Cassia occidentalis*."

Van Z. (P. R. 1423) on *Cassia* sp.

(598-12, 759-12, 667-12, 72-19); larvae on *Cassia occidentalis* (892-13, 740-14, 701-16, 88-20; on flowers of *Herpetica alata* at Guánica (GNW).

**Callidryas neleis** Boisduval

Dewitz. Stahl. Möschler. Gundlach.

**Callidryas statira** Cramer

(as *C. evadne* Bois.) Dewitz. Stahl.  
Möschler. Gundlach, "La oruga se cría en las *Cassias*."

**Callidryas thalestris** Hübner

Dewitz. Möschler. Gundlach, "La oruga se cría en varias especies de *Cassia* y en la *Poinciana*."

**Callidryas trite** Linnaeus

Dewitz. Stahl. Möschler. Gundlach.

**Callidryas rorata** Butler—det. Schaus "a female aberration of *argante* Fabr."

larva on *Inga vera* at Cayey (33-21).

**Kricogonia castalia** Fabricius

(as *Gonepteryx*) Dewitz. (as *Rhodocera* (G.) *lycide* God.—*C. Fabr.*) Stahl.

Möschler. Gundlach, "Vive más bien cerca de la costa."

**Anteos (Gonepteryx) clorinde** Godart

Dewitz.

**Anteos (Gonepteryx) maerula** Fabricius

Dewitz. Möschler. Gundlach, "La oruga se cría en especies de *Cassia*."

**Terias citrina** Poey

var. *portoricensis* Dewitz 77-237.

Möschler. Gundlach.

**Terias elathea** Cramer

(as *Eurema*) AMNH.

**Terias euterpe** Ménétries

Van Z. (P. R. 135). (as *Eurema*) AMNH.  
(303-12, 258-17), at Algarrobo (812-14).

**Terias jucunda** Boisduval & Leconte

(as *T. ebriola* Poey) Dewitz. Stahl.

Möschler. Gundlach, "La oruga se encuentra sobre el *Desmodium*."

**Terias lisa** Boisduval & Leconte = **T. sulphurina** Poey

Dewitz. Stahl. Möschler. Gundlach, "La oruga vive, según Boisduval, en la *Cassia* y *Glycine*."

**Terias palmira** Poey

Dewitz. Stahl. Möschler. Gundlach; "Su oruga sobre el *Desmodium*."

## PAPILIONIDÆ.

**Papilio androgeus** Cramer

Möschler. Cotton 17-121; "Caterpillars—abundant in one (citrus grove)."

(as *P. polycæon* Cramer) Dewitz. Stahl. Gundlach, "Su oruga se cría en especies del género *Citrus*."

Determined as var. *epidaurus* Godman & Salvin by Dr. Frank E. Watson.

larvae on citrus (931-16), at Manatí (806-16), at Lares (161-22).

**Papilio cresphontinus** Martyn

(as *P. aristodemus* Esper) Dewitz.

(as *P. daphnis* Martyn—*P. aristodemus* Esper) Stahl.

Möschler. Gundlach.

**Papilio pelaus** Fabricius

Dewitz. Stahl. Gundlach, "He cogido una crisálida fijada en el tronco de un *Xanthoxylum*, y probablemente la oruga se cría en esta mata."

at Martin Peña (24-14); twenty fully-grown larvae clustered on tree trunk of *Fagara* (*Xanthoxylum*) *martinicensis*, on web they had spun, unmoved by ant biting one or by a lizard running over the group, at Cayey (345-22).

Fully-grown caterpillars are about 45 mm. long and 10 mm. broad at the thorax; head dull light yellow, very dark brown around the ocelli, numerous spots subtending hairs and the inverted Y creamy; general color of body purplish and greenish-brown (olive-drab), intricately marked with darker brown anteriorly, especially partly surrounding two dull yellow areas just posterior of the orange yellow osmaterias, and posteriorly with numerous lighter markings like wisps of white smoke; large very irregular creamy spots on the sides of 5th, 6th and 7th (together) and 10th and 11th (together) segments—

body lighter colored beneath from 5th to 11th segments, with narrow whitish band connecting them just above the legs; two latero-dorsal warts on each segment, usually lighter colored and with a small lavender spot, irregular but sharply outlined, mediad of each wart, similar lavender spots occurring along the sides and below the spiracles, additional smaller lateral warts on the thorax; true legs dull light yellow, tipped and laterally marked with brown.

**Papilio polydamus** Linnaeus

Dewitz. Stahl. Möschler. Gundlach, "La oruga se cría en especies de *Aristolochia*. Exhala un olor a almizcle."  
at Algarrobo (822-14).

**Papilio nitra** Edwards

Van Z. (One specimen recorded by Dr. Hooker, Mayagüez, July 14, 1912.)

HESPERIIDÆ.

**Eudamus dorantes** Stoll

(as *Goniurus*) Dewitz. Stahl.  
(as *Goniuris*) Möschler. Gundlach.  
Van Z. (P. R. 1433).

**Eudamus proteus** Linnaeus

(as *Goniurus*) Dewitz. Stahl. Möschler. (as *Goniuris*) Gundlach, "La oruga en papilionaceas (*Clitoria*)."

Van Z. (901) on beans.

Jones 15-7: on garden beans, cowpeas and *Phaseolus cathyroides*.  
Cotton 18-277: notes, on beans.

(304-12, 671-12); larvæ on cowpeas (155-12), on beans (851-16, 132-22), on beggar weed, *Meibomia tortuosum* (871-14, 348-16), on *Stigmatophyllum ligulatum* at Loíza (131-23).

**Goniurus talus** Cramer

(as *Goniloba*) Dewitz. (as *Eudamus*) Möschler. Gundlach, "La oruga se cría en *Guarea trichilioides*."

**Epargyreus zestos** Hübner

(as *Goniloba*) Dewitz. Stahl.  
(as *Aethilla*) Möschler. Gundlach.

**Acolastus amyntas** Fabricius

(as *Goniloba* or *Erycides*) Dewitz.  
(as *Goniloba savignyi* Encycl.—*amyntas* Fab.) Stahl:  
(as *Hesperia*) Möschler. Gundlach.

adults common at Boquerón (25-23 det. Schaus); larvae on *Ichthyomethia piscipula* at Boquerón and Pt. Cangrejos, have flat, heart-shaped heads, black in earlier instars, lemon yellow in final instar with a large black spot on each side of the dorsal cleft.

**Proteides idas** Cramer

(as *Goniloba*—var. *pedro*) Dewitz. (as *Goniloba*) Stahl.  
(as *Eudamus*) Möschler. Gundlach.

**Telegonus anaphus** Cramer

(as *Goniloba*) Dewitz. Stahl.  
(as *Aethilla*) Möschler. Gundlach.

**Melanthes brunnea** Herr. Sch.

(as *Nisoniades* & in synonymy with *Antigonus pterus* Cr.) Stahl.

**Eantis thraso** Hübner

(as *Achyloides*) Dewitz. Stahl. Möschler. Gundlach.  
Van Z. (22) on orange. AMNH.

Cotton 17—21: "fairly common in some (citrus) groves."

larvæ on grapefruit leaves (9-20, 26-20), at Pt. Salinas (176-15), at Vega Alta (236-17); on wild orange at Aibonito (GNW), at Lares (405-22), in mountains north of Yauco (365-21); on *Zanthoxylum (Fagara) monophyllum* at Boquerón (26-23).

Head of larva, large, short, heart-shaped, in earlier instars reddish-brown, in last instar light greenish-brown, with darker mouth-parts. Body light yellowish-green with darker green narrow medio-dorsal stripe and broad lateral yellow bands made up of five irregularly rectangular spots on each segment. Neck and true legs yellow. Body in earlier instars is rounder and less tapering and with no indications of striping.

Chrysalis, green with whitish bloom, easily rubbed off, protruding eyes, held in a silken girdle and by cremaster in a slight cocoon in a rolled leaf. It becomes dark bluish-purple a day previous to the emergence of the adult.

**Brachycorene arcas** Drury

(as *Antigonus flyas* Cramer) Dewitz. Stahl.

(as *Antigonus*) Möschler. Gundlach, "La oruga se cría en especies de la familia de las apocíneas, v. g. del género *Echites*." With *Melanthes zepodea* Hübner, described from the female, in synonymy, as proved by rearing.

at Ponce (138-13), at Pt. Cangrejos (646-21); larvae on *Stigmatophyllum ligulatum* at Pt. Cangrejos (88-16, 629-21), at Loíza (132-23, a male and a female, *Melanthes zepodea* Hübner, reared from caterpillars identical in appearance), at Boquerón (27-23).

Larva, when fully grown, about 30 mm. long. Head, heart-shaped, short, broad ventrally, in earlier instars dark brown to piceous, roughly pitted subtending orange-colored hairs, with orange-colored markings: a large pair in front of the ocelli, a smaller pair behind, a dot above, a larger spot higher up and a broad band passing over the top of each side of the head; in last instar, light yellow in color with markings



of chrome yellow as in earlier instars of orange, mandibles and ocelli shining dark brown. Body light green, approximating in color the under-side of the leaves of the host plant, but darker in the middle and especially along the medio-dorsal line, nearly hemi-spherical in cross-section, and held closely appressed to the leaf. The body color is made up of a groundwork of grey-green, modified by numerous small bright yellow spots, which are confluent in two pairs of lateral lines, bounding the medio-dorsal line, and as latero-dorsal lines. Thoracic segments lighter in color, legs light yellowish-green, spiracles bright yellow.

Chrysalis 17 mm.  $\times$  5.5 mm. Shiny and glistening, with faint cocoon and well-developed girdle, but well concealed in folded leaf. Light apple green in color, especially on the dorsum of the abdomen, where the yellow spots and four lines of the larva persist, elsewhere greyer, more cloudy and somewhat opalescent; head blunt with sharp corners and covered with transparent hairs, curved at their ends; eyes opaque, white, sub-triangular, margined posteriorly with black; venation of wings showing as faint white lines.

**Pyrgus syrichtus** Fabricius

(as *P. orcus* Cr.) Dewitz. Stahl. Möschler. Gundlach, "La oruga se cría en malvaceas, v. g. *Sida*."

(as *Hesperia*) Van Z. (P. R. 131) AMNH.

at Naguabo on El Duque (737-14), at Algarrobo (815-14), at Quebradillas (EGS); larvae on *Sida carpinifolia* and *S. antillensis* (331-16, 368-16).

**Pyrgus crisia** Herr. Sch.

Dewitz. Möschler. Gundlach.

**Nisoniades jaracco** Lefebvre (in Lucas) = **N. juvenalis** Herr. Sch. Stahl.

**Hylephilia phylaeus** Drury

(as *Pamphila*) Dewitz.

(as *Hesperia*) Möschler. Gundlach. /

Van Z. (P. R. 130). AMNH.

(156-12).

**Atalopedes cunaxa** Hewiston

(as *Pamphila mesogramma* Poey) Dewitz. Stahl.

(764-12 det. Schaus).

(as *Hesperia*) Möschler. Gundlach, "el nombre *alameda* Lefebvre es anterior a *cunaxa* Hewiston."

**Thymelicus brettus** Boisduval

(as *Goniloba coscina* Herr. Sch.) Stahl.

(as *Hesperia*) Gundlach.

**Choranthus haitensis** Skinner—det. Schaus.

(as poss. *C. ammonia* Plotz. det. Carl Heinrich) Wolcott 21-40:  
larva on sugar cane, life-history and description of stages.

**Catia otho** Abbott & Smith

(as *Pamphila* or *Oligoria*) Dewitz.

(as *Hesperia*) Möschler. Gundlach.

(as *Catia druryi* Latr.) AMNH.

(432-12), on El Duque at Naguabo (731-14, 732-14, 733-14), at Algarrobo (819-14 det. Schaus).

**Atrytone vittelius** Fabr.

(as *Pamphila*) Dewitz.

(as *Hesperia hubneri* Plotz.) Möschler. Gundlach.

Smyth 19-143: on sugar cane, Sudan grass and wild grasses.

Jones & Wolcott 22-42: on sugar cane, description of all stages.

larvae on sugar cane (29-14), (12-22), at Barceloneta (19-22), at Cayey (GNW).

**Lerodea tripuncta** Herr. Sch.

(as *Cobalus*) Dewitz. Stahl.

(as *Hesperia*) Möschler. Gundlach.

at Quebradillas (EGS det. Schaus).

**Calpodus ethlius** Cramer

Gundlach, "La oruga se alimenta de las hojas de Maranta y canna, y difiere por su forma, transparencia de la piel, y por la forma de la chrisalida de las otras especies antillanas."

Van Z. (1645) on *Canna coccinea*.

all stages on *Canna edulis* at Pt. Cangrejos, eggs being parasitized by *Trichogramma pretiosa* Riley (190-15); larvae on *Canna* (47-16, 865-16), a serious pest on the cannas at the Union Club, Santurce, (JDM), which had to be sprayed with Arsenate of Lead.

**Prenes nero** Fabricius

(as *Goniloba*) Dewitz.

(as *Hesperia*) Möschler. Gundlach.

(and as *Hesperia sylvicola* H. S.) Gundlach. Möschler.

(as *Goniloba sylvicola* H. S.) Dewitz. Stahl.

Van Z. (319) on sugar cane and grasses.

Van Dine 13-34; Van Dine 13-257; Jones 14-462; Smyth 19-143: on sugar cane.

Wolcott 21-38: notes, on sugar cane.

Jones & Wolcott 22-39: description of all stages and notes: larvae on sugar cane, rice, bamboo, malojillo, *Panicum barbinode*, grass and Johnson grass. Illustrations of larvae, pupa and adult.

(103-12); larvae on sugar cane (11-12, 5-13, 355-13, 979-13, 999-13, 1201-13, 1202-13, 9-14), at Luquillo (224-13), at Toa Alta (643-21); on *Panicum barbinode* (9-14).

**Prenes ares** Felder

Van Z. (320) on grasses and sugar cane.

Jones 14-462; Smyth 19-143: on sugar cane.

Wolcott 21-38: on sugar cane, notes.

Jones & Wolcott 22-41: description of all stages, notes, and illustrations of larva and pupa.

on El Duque at Naguabo (734-14); larvae on sugar cane (151-12, 25-13, 1216-13, 1217-13, 1218-13), on coarse grass (34-13), at La Plata (157-12).

**Prenes ocola** W. H. Edwards

AMNH.

at Algarrobo (817-14); larva on sugar cane (119-12), on *Hymenachne amplexicaule* (980-13).

**Prenes parroquinoides** Skinner

AMNH.

**Cymaenes silius** Latreille

(as *Pamphila*) Dewitz. Stahl.

(as *Hesperia*) Möschler. Gundlach.

**Perichares corydon** Fabricius

(as *Goniloba*) Dewitz. Stahl.

(as *Hesperia*) Möschler. Gundlach, "La oruga se cría en varias gramíneas de hojas no pequeñas, pues se esconde entre ellas reunidas con su seda, como todas las orugas de esta familia."

Van Z. (308) on sugar cane.

Wolcott 21-40: on sugar cane.

Jones & Wolcott 22-28: on sugar cane.

(1-21); larvae on sugar cane at Arecibo (127-13), at Toa Alta (630-21, 645-21), at Guánica (18-22).

SPHINGIDÆ.

Determinations of Sphingidae in the Insular Station collection are by Mr. B. Preston Clark, or by the individual collectors, confirmed by Mr. Clark.

**Herse cingulata** Fabr.

(as *Sphinx*) Dewitz. Möschler. Gundlach.

(as *Macrosila*) Stahl.

(as *Phlegethontius convoluti* Linn.) Jones 15-7: on sweet-potato.

Van Z. (918) on sweet-potato.

(224-12, 120-21); larvae present in enormous abundance on sweet-potato along north-west coast of Porto Rico, between Arecibo and Aguadilla (110-December, 1918), many parasitized by Tachnid flies, *Belvosia bifasciata* Fabr. "Farmers at Hattillo say that about December 10th the larvae were seen by millions, and that after devouring all sweet potato vines in one field they migrated to another in hordes, crawling over one another 'in streams like ants.'" E. G. Smyth.

**Cocytius antaeus antaeus** Drury

(as *Amphonyx*) Dewitz. Stahl. Möschler. Gundlach, "La oruga se cría en *Anona muricata*."

at light (147-12, 779-14, 571-16, 50-19), at Guánica (494-14); parasitized larva on *Anona* (43-19).

**Cocytius cluentius** Cramer

(as *Amphonyx*) Dewitz. Stahl. Möschler. Gundlach.

(one unlabeled specimen.)

**Protoparce brontes** Drury, var. *smythi* Clark, B. P., Proc. New England Zoological Club, Vol. 4, p. 100, pl. x, fig. 1, March 21, 1919, TYPE of variety from Porto Rico.

(as *Sphinx brontes* Dr.) Dewitz. Möschler. Gundlach.

(as *Macrosila*) Stahl.

at light (719-16 TYPE of variety, 1006-16).

**Protoparce rustica rustica** Fabricius

(as *Sphinx*) Dewitz. Möschler. Gundlach, "La oruga vive en *Sesamum* y en *Tecoma stans*."

(as *Macrosila*) Stahl.

Van Z. (P. R. 1431).

at light (351-16).

**Protoparce sexta** Joh., var. *jamaicensis* Butler

(as *Macrosila carolina* Linn.) Dewitz. Stahl.

(as *Sphinx carolina* Linn.) Möschler. Gundlach, "Muy dañina al cultivo del tabaco, y en las huertas al tomate (*Lycopersicum*)."

(as *P. carolina* Linn.) Busek 00-89: on tobacco.

(as *P. carolina* Linn.) Barrett 03-448: economic notes.

(as *Phlegathontius*) Tower 08-36: eggs parasitized by *Telenomus monilicornis* Ashmead.

Van Z. (1101) on tobacco and tomato.

Jones 15-7: notes.

Cotton 18-310: notes.

Wolcott 22c-5: life history and control, illustrations of all stages and larva in beak of mozambique, *Holoquiscalus brachypterus*.

larvae on tomato (866-16); on *Solanum torvum* (181-12, 971-16), at Guánica (549-13); on tobacco at Aibonito (788-15), at Bayamón (16-19), at Arecibo (231-19), at Mayagüez (39-19).

**(Ceratonia amyntor** Geyer

Van Z. (P. R. 1432).)

**Protambulyx strigilis** Linn.

(as *Ambulyx*) Dewitz. Stahl. Möschler. Gundlach, "La oruga vive en *Comocladia* y también en *Erythroxylum*."

at light, July and August (434-16, 559-16, 784-16, 817-16); larvae (? of this species) on *Anona muricata* (21-19, 112-19).

**Pseudosphinx tetrico** Linn.

Dewitz. Stahl. Möschler. Gundlach, "Oruga en *Plumeria*."

Busck 00-90: on *Plumieria rubra*.

Van Z. (1638) on *Plumeria*.

(264-16); larvae on *Plumiera alba* (134-20), very abundant at Ballena, on the coast by Guánica (725-15, 810-15).

**Erinnyis alope** Drury

(as *Anceryx*) Dewitz.

(as *Dilophonota*) Stahl. Möschler. Gundlach, "La oruga se cría en *Carica papaya*."

Van Z. (P. R. 1430),

at light (436-16, 1013-16); larvae on host (45-16, 985-16, 122-21).

**Erinnyis ello** Linn.

(as *Anceryx*) Dewitz.

(as *Dilophonota*) Stahl. Möschler. Gundlach, "La oruga se cría en *Jatropha manihot*." Notes on *Microgaster flaviventris* Cresson as a parasite of the larva.

Van Z. (1233) on *Carica papaya*.

at light (780-12, 1220-13, 321-16, 785-16); larvae on *Chamaesyce hyssopifolia* (781-14, 872-14, 1014-16); larvae on *Manihot utilisima* at Aguadilla (129-18).

**Erinnyis crameri** Schaus

at light (741-16).

**Erinnyis domingonis** Butler

at light (423-17).

**Erinnyis merianae** Grote

(as *Anceryx*) Dewitz.

(as *Dilophonota*) Möschler. Gundlach, "La oruga se cría en *Carica papaya*."

**Erinnyis oenotrus** Cramer

(as *Anceryx*) Dewitz.

(as *Dilophonota*) Möschler. Gundlach. Stahl.

**Erinnyis stheno** Hübner

(as *Dilophonota*) Stahl. Möschler. Gundlach.

**Isongnathus rimosa** Grote, var. **wolcottii** Clark, B. P., Proc. New England Zool. Club, Vol. 8, p. 8, January, 1922, TYPE of variety from Porto Rico.

(as *Anceryx rimosa* Dr.) Dewitz.

(as *Dilophonota*) Möschler. Gundlach, "La oruga se cría en *Plumeria*."

(one unlabeled specimen, TYPE of the variety.)

**Pachylia ficus** Linn.

Dewitz. Möschler. Gundlach, "La oruga se cría en especies del género *Ficus*."

Van Z. (P. R. 1422).

at light (1041-16, 16A-19), at Guánica (379-15, 714-15); larvae on *Ficus repens* (124-21), on *Castilloa elástica* (GNW); on *Ficus* sp. at Guánica (493-14).

**Epistor lugubris** Linn.

(as *Enyo*) Dewitz. Stahl. Möschler. Gundlach, "La oruga vive en varias especies de *Cissus* o *Vitis*."

at light (511-12, 432-16, 72-21, 189-21).

**Madoryx oiclus** Cramer

pupating larva under rose bush at Río Grande (151-23).

**Cautethia grotei** Henry Edwards

(as *Oenosanda noctuiformis* Walker) Dewitz.

(as *Oenosanda*) Möschler. Gundlach.

**Sesia tantalus** Linn., var. *zonata* Drury

(as *Macroglossa*) Dewitz. Stahl. Möschler. Gundlach, "Se cría en plantas de la familia de las rubiaceas, v. g., *Genipa*, *Randia*, *Alibertina*."

(one unlabeled specimen.)

**Sesia aedon** Boisduval

(as *Macroglossa*) Möschler. Gundlach.

**Perigonia lusca** Fabr., var. *interrupta* Walker

Dewitz. Möschler. Gundlach, "La oruga vive de *Genipa*, *Rondeletia*, *Gonzalea*, y otras rubiaceas."

**Pholus labruscae** Linn.

(as *Philampelus*) Dewitz. Stahl. Möschler. Gundlach, "La oruga se cría en especies del género *Vitis*."

Van Z. (P. R. 1425).

at light (781-12, 558-16).

**Pholus fasciatus** Sulzer

(as *Philampelus*) Dewitz. Stahl. Möschler. Gundlach, "La oruga se cría en *Jussiaea*."

Van Z. (P. R. 1426).

larvae on *Jussiaea* sp. (41-16), common at Martin Peña (152-23).

**Pholus vitis vitis** Linn.

(as *Philampelus*) Dewitz. Stahl. Möschler. Gundlach, "La oruga se cría en *Cissus* (*Vitis*) *sicyoides*."

at light (433-16, 1077-16).



**Xylophanes chironnechus** Cramer

(as *Chorocampa nechus* Cr.) Dewitz. Stahl.

(as *Chorocampa chiron* Dr.) Möschler. Gundlach.  
at light (61-16).

**Xylophanes pluto** Fabr.

(as *Pergesa thorates* Hübner) Dewitz. Möschler.

(as *P. pluto* Fabr.) Gundlach, "La oruga se cría en *Erythroxylum*."  
at light (782-12).

**Xylophanes tersa** Linn.

(as *Chorocampa*) Dewitz. Stahl. Möschler. Gundlach, "La oruga se cría en *Spermacoce*."

Van Z. (P. R. 1415).

at light (12-12, 433-12, 435-16, 743-16, 23-19, 74-19); larvae on *Mitracarpus* (*Spermacoce*) *portoricensis* (768-16, 231-21); on *Diodia sarmentosa* at Mameyes (28-15).

**Celerio lineata lineata** Fabr.

(as *Deilephila*) Dewitz. Stahl.

(as *D. caucus* Fabr.) Möschler. Gundlach, "He cogido las orugas en *Oenothera* de los jardines, en *Claytonia perfoliata* y en *Boerhaavia*."

Van Z. (P. R. 1424).

at light (783-12, at Guánica (1089-13).

AMATIDÆ (SYNTOMIDÆ).

**Bombiliodes capistrana** Fabr.

(as *Glaucopis selecta* Herr. Sch.) Dewitz. Stahl. Möschler.  
Gundlach.

**Mallodeta partheni** Fabr.

(as *Glaucopis multicineta* Walker) Dewitz.

(as *Poecilosoma multicineta* Walker) Möschler. Gundlach.

at light (197-12), at Vega Alta (113-17), at Guánica (633-13 det. Dyar.).

**Eunomia insularis** Grote

(as *Glaucopis*) Dewitz. Möschler. Gundlach, "La oruga en las convolvulaceas."

"*E. rubripunctata* Butler may be the species listed as *insularis* Grote, of which we have no specimens yet from Porto Rico." Wm. Schaus.

**Nyridela chalciope** Hübner

(as *Glaucopis*) Dewitz. Stahl.

(as *Isantherene*) Möschler. Gundlach, "La oruga se cría en la *Cupantia americana*."

**Cosmosoma auge** Linn.(as *Glaucopis omphale* Hübner) Dewitz. Stahl.(as *C. omphale* Hübner) Möschler. Gundlach, "La oruga se cría en la *Mikania*."

Van Z. (P. R. 1401).

at light (144-16), at Arecibo (149-13), at Aibonito (SSC).

**Cosmosoma achemon** Fabr.(as *Glaucopis tyrrhene* Hübner) Dewitz. Stahl.

at light at Arecibo (151-13 det. Schaus).

**Lymire melanocephala** Walker—det. Schaus.

(one unlabeled specimen.)

**Lymire (Echeta) flavicollia** Dewitz 77-94, TYPE from Porto Rico.(as *Echeta*) Stahl. Möschler. Gundlach.**Lymire albipennis** Herr. Sch.(as *Echeta*) Dewitz. Stahl.**Horama panthalon** Fabr.

Dewitz. Möschler. Gundlach.

abundant at Boquerón (31- Jan. 9, 1923).

**Horama pretus** Cramer

Dewitz. Stahl. Möschler. Gundlach.

Van Z. (P. R. 151).

at light (283-12), at Guánica (682-13); in coitu, feeding at flowers of *Tournefortia* sp. at Pt. Salinas (235-16); at flowers at Boquerón (30-23); larvae on *Elaeodendron xylocarpum* at Pt. Cangrejos (858-16), at Boquerón (111-23).

Fully-grown larvae are about 15 mm. long and 7 mm. wide, bright reddish-orange, reddest on thorax and head, shining. Body clothed with numerous spreading tufts of grey and white hairs, curved towards their tips. On the seven anterior abdominal segments dorsally are four compressed tufts of black hair in pairs, bending towards each other, the anterior pair of each segment closer together and touching at apex.

Cocoon of thin grey silk with the longer hairs from the larva entangled in it. Pupa bright reddish brown.

**Empyreuma pugione** Linn.Dewitz. Stahl. Möschler. Gundlach, "Oruga en *Nerium*."(as *E. lichas* Cramer) Van Z. (1634) on oleander.

Van Zwaluwenburg 16-45: Eggs round, yellow—brown before hatching—slightly iridescent, finely sculptured, with dull sheen, regularly spaced in groups on under side of leaf. Larvae dull orange, hairy, with silvery lateral stripes. Larval stage 26 days, pupal stage 13 days. Adult has crimson wings and dark-blue body.

at light (107-16); larvae on oleander (91-21), at Arecibo (184-19).

**Correbidia terminalis** Walker

(as *Charidea cimicoides* Herr. Sch.) Dewitz. Stahl. Möschler. Gundlach, "La oruga --- vive en la cara inferior de las hojas de *Cecropia*, formando luego un capullo poco primoroso."

**Correbidia bicolor** Herr. Sch.

(as *Charidea*) Möschler. Gundlach.

**(Charidea proxima** Grote

Dewitz. Möschler. Gundlach.)

**Lycomorpha fumata** Möschler 89-114, TYPE from Porto Rico. Gundlach.

**(Orodesma apicina**

Stahl.)

LITHOSIIDÆ.

**Progona (Delphyre) pallida** Möschler 89-118, TYPE from Porto Rico. Gundlach.

**Agylla sericea** Druce

(as *Gnophria limpida* Möschler) Möschler 89-117, TYPE from Porto Rico. Gundlach.

**Paramulona albulata** Herr. Sch.

(as *Mieza*) Dewitz. Stahl.

**Cincia conspersa** Walker.

Möschler. Gundlach, with *Mieza albulata* H. S. in synonymy.

**Afrida tortriciformis** Möschler

Möschler. Gundlach.

NOLIDÆ.

**Nola (Stenola) bistriga** Möschler 89-119, TYPE from Porto Rico. Gundlach.

**Celama sorghiella** Riley

(as *Nola portoricensis* Möschler) Möschler 89-118, TYPE from Porto Rico. Gundlach.

larvae common in arrows of sugar cane (85-19, 382-22 det. Schaus).

ARCTIIDÆ.

**Eupseudosoma involuta** Sepp

(as *E. nivea* Herr. Sch.) Dewitz. Stahl. Möschler. Gundlach, "La oruga en *Psidium*."

beautiful brown hairy larva on guava, *Psidium guajava*, (74-21), at Caguas (138A-16).

**Ammalo insulata** Walker

(as *Pareuchaetes cadaverosa* Cramer and *P. affinis* Grote, not in synonymy) Dewitz. Stahl. Möschler. Gundlach, "La oruga vive en *Vernonia*, *Eupatorium*."

on weeds (889-14), on grass (307-16), at Aibonito (SSC); at light at Guánica (1061-13 det. Dr. Frank E. Watson); from pupa at Pt. Cangrejos (GNW).

**Opharus (Halisidota) bimaculata** Dewitz, 77-95, TYPE from Porto Rico.

Möschler. Gundlach.

**Halisidota cinctipes** Grote

Dewitz.

(as *H. tessellaris* Hübner) Möschler. Gundlach, "La oruga vive probablemente en *Hibiscus*."

**Ecpantheria icasia** Cramer

(and as *E. eridane* Cr., not in synonymy) Dewitz. Stahl. Möschler. Gundlach.

(as *E. eridanus* Cramer) Van Z. (1630) on *Erythrina micropteryx*, *Ipomoea* sp., orange and banana. (Synonym of *E. icasia*—reared from same egg cluster and mated.)

Van Zwaluwenburg, R. H., "Notes on the Life History of *Ecpantheria eridanus* Cramer." In *Insecutor Inscitiae Menstruus* Vol. 4, Nos. 1-3, Jan.-March, 1916, pp. 12-17: an extended account, giving additional host plants as vanilla and *Cissus sicyoides*, description of all stages, life history and *Eremotylus angulatus* Hooker as a parasite of the larva.

Cotton 18-285: as a pest of celery, attacking the stalks.

at light (6-20): at Guánica (651-13); at Juncos (40-19); at Aibonito (SSC); pupa under loose bark on tamarind tree at Toa Baja (45-15): larvae on eggplant, bean, tomato (100-16), on *Erethites hieracifolia* (818-16), on celery, injuring the stalks (62-17, 205-17), not on host (539-12); egg-cluster on *Psidium guajava*, from which 2,450 larvae hatched (13-17).

**Calidota strigosa** Walker

(as *Halisidota*) Dewitz. Stahl. Möschler. Gundlach.  
(one unlabeled specimen.)

**Utethesia bella** Linnaeus and **U. ornatrix** Linnaeus

(as *Depiopeia*) Dewitz.

(and as *Callimorpha*) Stahl.

Möschler. Gundlach, "La oruga se cría en *Crotalaria*."

(and as *U. venusta* Dalm. (P. R. 137)) Van Z. (2006) on *Crotalaria*.

(761-12, 738-14), at Mameyes (802-12), at light (367-12, 53-17). at Guánica (561-13); larvae on *Crotalaria retusa* (856-14, 44-15), at Isabela (433-21), at Guánica (701-14).

## PHALÆNOIDIDÆ (AGARISTIDÆ).

**Tuerta (*Agarista*) noctuiformis** Möschler 84-112, TYPE from Porto Rico.

Gundlach.

(one unlabeled specimen—det. Schaus.)

## NOCTUIDÆ.

**Chloridea obsoleta** Fabr.

(as *Heliothis armigera* Hübner) Stahl. Möschler. Gundlach,  
“En las mazorecas del maíz y en las cápsulas del algodón.”

(as *Heliothis*) Barrett 03-443: attacking corn.

May 06-13: “only serious insect pest of corn.”

Jones 15-7: mention.

Van Z. (906), on sugar cane.

Cotton 18-289: as a pest of corn.

Van Zwaluwenburg 15-35: attacking corn, tobacco buds and seed pods, and tomatoes.

Smyth 20-121: attacking corn.

at light at Guánica (668-13); larva in corn ear (223-12).

**Chloridea virescens** Fabr.

Möschler. Gundlach, “La oruga es muy dañina, principalmente al tabaco, pues vive en el cogollo y luego también en las cápsulas. Lo mismo en las cápsulas de *Hibiscus*, *Sesamum* y otras plantas. Una oruga que llevaba en la mano me mordía, y puesta con otras orugas se las comía.”

Van Z. (1627) on *Cajanus cajan*.

larva on cotton at Sabana Grande (505-22).

**Feltia annexa** Treitschke

(as *Agrotis*) Stahl. Möschler. Gundlach, “La oruga vive durante el día al pie de plantas tiernas y sale al oscurecer para comer el tronco tierno. Causa daño en las huertas.”

Jones 15-8: mention. Wolcott 22c-12: as a pest of tobacco and methods of control, illustration of larva, the “cuerudo” of tobacco growers.

at light at Guánica (676-13 det. Watson); larvae on alfalfa at Fajardo (337-13 det. Dyar); larvae on tobacco at Cayey (73-21, 383-22, 8-23), at Caguas (150-21), at Corozal (Juan López), at Manatí and at Hatillo (GNW).

**Rhynchagrotis ormalis** Grote, var. *fecula* Grote  
Dewitz.

**Agrotis repleta** Walker—det. Dyar  
larva on sugar cane (150-12).

**Agrotis submucosa** Herr. Sch.  
Möschler. Gundlach.

**Agrotis apicalis** Herr. Sch.

Möschler. Gundlach.

**Lycophotia infecta** Ochseneheimer(as *Agrotis incivis* Guenee) Möschler. Gundlach.

Van Z. (1509) on millet, grass, seed cane.

at light at Guánica (629-13 det. Dyar); pupa in tobacco field at Cayey (346-22 det. Schaus).

**Miselia parvula** Herr. Sch.(as *Mamestra*) Möschler. Stahl. Gundlach.at light (1009-16); larvae on *Solanum nigrum* (310-16, 373-16), at Isabela (503-18).**Tiracola plagiata** Walker(as *Agrotis grandirena* Herr. Sch.) Möschler. Gundlach.**Xanthopastis timais** Cramer(as *Euthisanotia*) Stahl. Möschler. Gundlach, "La oruga se alimenta de las hojas y cebellas de amarilideas."Van Z. (1624) on *Hibiscus rosa-sinensis* and *Xanthosoma* sp.larvae on the White Spider Amaryllis, *Hymenocallis expansa*, (54-16, 132-16), at Pt. Salinas (185-15). A common pest of this plant along the beach of the north coast.**Cirphis clarens** Herr. Sch.(as *Leucania*) Möschler. Gundlach.**Cirphis secta** Herr. Sch.Stahl. (as *Leucania commoides* Guenee) Möschler.(as *Leucania*) Gundlach.**Cirphis latiuscula** Herr. Sch.(as *Leucania*) Stahl. (as also as *L. punctifera* Möschler and as *L. senescens* Möschler, 89-142, TYPE from Porto Rico, not in synonymy) Möschler. Gundlach.

Van Z. (2010) on sugar cane, grasses.

Van Dine 13-257; Van Dine 13-33; Jones 14-462; Smyth 19-144: on sugar cane. Jones & Wolcott 22-43: description of larva and adult, larva feeds on older leaves of sugar cane and is parasitized by *Apanteles marginiventris* Cresson, *Euplectrus* sp., and a Tachinid fly, *Compsilura oppugnator* Walton.

abundant at light at Guánica (638-13); larvae on sugar cane (224-11, 50-12, 101-12, 673-12, 37-13, 1219-13), at Toa Baja (29-15), at Vega Alta (189-13), at Mayagüez (79-19), at Santa Isabel (466-13).

**Cirphis unipuncta** Haworth(as *Leucania extranea* Guenee) Stahl. Möschler. Gundlach.

at light at Guánica (667-13); larvae on grass at Cayey (191-12).



**Cirphis inconspicua** Herr. Sch.

(as *Leucania*) Stahl. Möschler. Gundlach.

**(Cirphis phragmitidicola** Guenee

(as *Leucania*) Möschler. Gundlach.)

**(Heliophila rimosa** Grote

Dewitz.)

**Magusa orbifera** Walker

(as *Laphygma angustipennis* Möschler) Möschler. Gundlach.

**Cobaliodes tripunctus** Hübner

Dewitz 77-243.

**Perigea apameoides** Guenee—det. Watson

at light at Guánica (1064-13).

**Perigea cupentia** Cramer

(as *Craniophora*) Möschler. Gundlach.

(as *P. infelix* Guenee) Stahl.

larva on *Pluchea purpurescens* (811-16 det. Schaus).

**(Perigera stelligera** Guenee

Möschler. Gundlach.)

"Wrongly identified by Möschler." Schaus.

**(Perigera subaurea** Guenee

Stahl. Möschler. Gundlach.)

"Wrongly identified I think." Schaus.

**Perigera albiger** Guenee

Möschler. Gundlach.

**Perigea concisa** Walker—det. Watson

at light at Guánica (1064-13).

**Perigea circula** Guenee

Stahl. Möschler. Gundlach.

(One unlabeled specimen — det. Schaus.)

**Perigea sutor** Guenee—det. Watson

larvae on *Pluchea purpurescens* (790-16).

**Perigea punctirena** Walker

(as *Hadena*) Möschler. Gundlach.

**Eriopus floridensis** Guenee

(as *E. elegantulus* Herr. Sch.) Möschler. Gundlach, "Criado en *Aspidium*."

larva on fern (276-22 det. Schaus).

**Eriopus jamaicensis** Möschler

Möschler. Gundlach.

**Agripodes jucundella** Dyar, H. G., *Insecutor Inscitiae Menstruus* Vol. 10, No. 10, 1922, TYPE from Porto Rico.

larva on lichen on trees in mountains north of Yauco (338-21 TYPE) is grey-green and dark-brown to resemble the lichen, and forms a thin, tough cocoon in the lichens. The moth has the fore-wings light green, marked with black and white, hind-wings grey. Collected by Francisco Seín Jr.

**Polyphaenis nona** Möschler 89-131, TYPE from Porto Rico.  
Gundlach.

**Cephalospargeta elongata** Möschler 89-120, TYPE from Porto Rico.  
Gundlach.  
at light at Guánica (644-13 det. Dyar).

**Prorachia daria** Druce—det. Dyar  
at light at Guánica (653-13).

**Catabena esula** Druce—det. Schaus.  
(One unlabeled specimen.)

**Catabena vitrina** Walker—det. Schaus.  
(as *Callierges divisa* Herr. Sch.) Möschler. Gundlach.  
(One unlabeled specimen.)

**Callierges recondita** Möschler 89-140, TYPE from Porto Rico.  
Gundlach.

**Laphygma frugiperda** Smith & Abbot

Stahl. Möschler. Gundlach, "La oruga daña a veces las siembras de maíz, caña y otras."

Van Z. (912) on sugar cane in seed beds, on *Panicum* sp.

Van Dine 13-31; Van Dine 13-257; Jones 14-462; Smyth 19-143: on sugar cane.

Jones, Thos. H., "Some Notes on *Laphygma frugiperda* S. & A. in Porto Rico" in *Jour. Ec. Ent.*, Vol. 6, No. 2, April 1913, pp. 230-236.

Jones 15-7: on corn and onions, attacked by three Tachinid parasites, one hymenopterous, three predators and two fungi.

Johnston 15-18: and Stevenson 18-207: host of *Botrytis rileyi* Farl. at Río Piedras and Guánica.

Cotton 18-288: on corn, native grasses, fruit of tomatoes and green pods of beans.

Wolcott 21-38: on sugar cane, malojillo grass and corn.

Jones & Wolcott 22-45 to 49: the most complete account, with illustrations of all stages from Walton & Luginbill.

at light at Guánica (67-19); larvae on sugar cane (161-12, 196-12, 216-12, 251-12), at Arecibo (176-11), at Ponce (736-12), at Mameyes (790-12), at Arroyo (938-13); eggs on sugar cane (345-12), at Guánica (128-13); larvae on corn

(28-12, 217-12, 552-12, 635-17), at Moca (114-23): larvae on malojillo grass, *Panicum barbinode*, (23-12, 601-16, 637-16), at Mameyes (790-12): larvae on grass, *Eriochloa subglabra* (317-16), on meadow grass (151-21): on gramma grass, *Stenotaphrum secundatum* in a pasture at Hatillo (223-21); on rice (623-17): on alfalfa at Fajardo (336-13): eggs on *Phaseolus lathyroides* (which the larvae ate) at Canóvanas (125-13): larvae on banana (18-19), on eggplant (140-17): on cotton at Sabana Grande (550-21): eggs on post at Guánica (128-13).

***Prodenia dolichos* Fabr.**

(as *P. commelina* S. & A.) Möschler. Gundlach.

***Prodenia pulchella* Herr. Sch.**

Möschler. Gundlach.

***Prodenia ornithogalli* Guenee**

(as *P. eudiopta* Guenee) Möschler. Gundlach.

Jones 15-8: on *Convolvulus*.

Wolcott 22c-13: larva attacking tobacco, illustration, known as "mantequilla" by tobacco-growers in Cuba.

at light at Guánica (665-13 det. Watson); larvae on eggplant (85-16), on rose (812-16), on fruit of tomato and pepper (543-16, 47-18); on tobacco at Cayey and Hatillo (67-23).

***Prodenia latifascia* Walker**

(as *P. androgea* Cramer) Stahl. Möschler. Gundlach, "La oruga vive durante el día al pie de una planta tierna y de noche sale de la tierra a comer. Hace mucho daño en las huertas y otras tierras cultivadas, pues troncha los renuevos. Come de muy diferentes plantas."

Van Z. (912) on tomato.

(unlabeled specimens — det. Schaus); larva on tobacco at Caguas (166-21).

***Prodenia testaceoides* Guenee**

Möschler. Gundlach.

***Xylomiges eridania* Cramer**

(as *Callierges*) Stahl. Möschler. Gundlach, "La oruga en *Amaranthus* y en *Solanum torvum*."

Jones 15-8: on *Amaranthus* sp.

(as *X. sunia* Guenee) Cotton 18-313: on tomato.

at light at Guánica (618-13); larvae on *Amaranthus spinosus* (177-11 det. Dyar), and also on *Solanum torvum* (52-12, 318-16, 349-16, 356-16, 602-16), on mulberry (117-23 det. Schaus); on *Amaranthus* at Guánica (505-13); on tomato (174-16).

**Xylomiges sunia** Guenee

(as *Callierges*) Möschler. Gundlach, "La oruga se cría en *Gossypium*."

Van Z. (P. R. 1443).

Cotton 18-287: as a pest of chard and other vegetables, description of stages, life history and control.

at light at Guánica (618-13 det. Dyar); larvae attacking alfalfa at Fajardo (387-13 det. Dyar); on Swiss chard (552-17, 588-17, 632-17), on green peas (552-17), on celery (595-17, 618-17), on asparagus (68-19); pupa (199-12).

**Galgula partita** Guenee

Möschler. Gundlach.

**Monodes deltoides** Möschler

Möschler. Gundlach.

**Monodes nucicolora** Guenee

Möschler. Gundlach.

at light at Guánica (684-13 det. Watson).

**Monodes arna** Möschler nec. Guenee

(as *Hadena*) Möschler. Gundlach.

(and as *Hadena chalconia* Hübner) Möschler. Gundlach.

at light at Guánica (635-13 det. Schaus).

**Monodes (Hadena) ligata** Möschler 89-130, TYPE from Porto Rico.

Gundlach.

**Monodes (Caradrina) promiscua** Möschler 89-142, TYPE from Porto Rico.

(One unlabeled specimen — det. Schaus.)

**Bagisara subusta** Hübner

(as *Atethmia inusta* Guenee) Stahl. Möschler. Gundlach.

at light (8-19), at Guánica (685-13 det. Watson and Schaus); on "saleilla", *Morongia leptoclada*, the probable host of the larva. E. G. Smyth.

**Caularis undulans** Walker

(as *Eudryas bartholomaei* Boisduval) Möschler. Gundlach.

rare at light at Guánica (649-13 det. Schaus).

**Cydosia submutata** Walker

(as *C. nobilitella* Cramer) Dewitz 77-95. Stahl. Möschler. Gundlach.

Van Z. (P. R. 1439).

at light (755-16), at Guánica (605-13 det. Dyar); in cane field at Mameyes (800-12); resting on eggplant (280-16); "believed to feed on *Solanum* sp." E. G. Smyth.

**Eublemma cinnamomea** Herr. Sch.

(as *Thalpochara*) Möschler. Gundlach.

**Eublemma obliqualis** Fabr.

(as *Thalpochares pallescens* Herr. Sch.) Möschler. Gundlach.

**Cobubatha quadrifera** Zeller

(as *Thalpochares grapholithoides* Möschler 89-167, TYPE from Porto Rico) Gundlach.

**Ommatocheila mundula** Zeller

(as *Thalpochares*) Möschler. Gundlach.

**Lithacodia apicosa** Haworth

(as *Erastria nigrifula* Guenee) Stahl.

(as *Erastria*) Möschler. Gundlach.

**Amyna octo** Guenee

(as *Mesostrotia stigmatula* Snell) Möschler. Gundlach.  
at light at Guánica (673-13 det. Schaus).

**Amyna bullula** Grote

(as *Mesostrotia imprimata* Möschler 89-163, TYPE from Porto Rico) Gundlach.

**Xanthoptera botyoides** Guenee

Stahl. Möschler. Gundlach.

**Xanthoptera aurifera** Walker

(as *X. tripuncta* Möschler 89-158, TYPE from Porto Rico) Gundlach.

**Anateinoma affabilis** Möschler 89-167, fig. 14, TYPE from Porto Rico.

Gundlach.

**Helicontia pantherulia** Herr. Sch.

(as *Emmelia uncinula* Herr. Sch.) Stahl. Möschler. Gundlach.

(One unlabeled specimen — det. Schaus.)

**Helicontia margana** Fabr.

(as *Emmelia variegata* Möschler 89-156, TYPE from Porto Rico, var. *ochracea* Möschler 89-156, TYPE of variety from Porto Rico) Gundlach.

(One unlabeled specimen — det. Schaus.)

**Helicontia perstructana** Walker

(as *Emmelia felina* Herr. Sch. and as *E. trigidula* Herr. Sch.)

Stahl. Möschler. Gundlach.

**Spragueia dama** Guenee

(as *Emmelia*) Möschler. Gundlach.

at light at Guánica (620-13 det. Dyar).

**Thalpochares albipectus** Möschler 89-167. TYPE from Porto Rico.

Gundlach.

- Thalpochares basalis** Möschler 89-169, TYPE from Porto Rico.  
Gundlach.
- Thalpochares putnami** Möschler 89-168, TYPE from Porto Rico.  
Gundlach.
- Cecharismena cara** Möschler 89-166, TYPE from Porto Rico.  
Gundlach.
- Cecharismena nectarea** Möschler 89-165, TYPE from Porto Rico.  
Gundlach.
- Krugia operta** Möschler 89-164, TYPE from Porto Rico.  
Gundlach.
- Haplostola aphelioides** Möschler 89-163, TYPE from Porto Rico.  
Gundlach.
- Metaponpneumata rogenhoferi** Möschler 89-159, TYPE from Porto Rico.  
Gundlach.
- Erastria minima** Herr. Sch.  
Möschler. Gundlach.
- Graeperia costalis** Walker—det. Schaus.  
(One unlabeled specimen.)
- Tarachidia (Acontia) mixta** Möschler 89-162, TYPE from Porto Rico.  
(as *Acontia*) Gundlach.
- Tarachidia semiflava** Guenee—det. Schaus.  
(One unlabeled specimen.)
- Tarachidia (Hadena) disgrega** Möschler 89-128, TYPE from Porto Rico.  
(as *Hadena*) Gundlach.  
very abundant at light at Guánica (584-13, determination and generic transfer by Mr. Schaus).
- Eutelia blandula** Herr. Sch.  
(as *Eurhipia*) Möschler. Gundlach.
- Eutelia ablatrix** Guenee  
(as *Penicillaria*) Möschler. Gundlach.
- Eutelia (Penicillaria) cuprea** Möschler 89-179, TYPE from Porto Rico.  
(as *Penicillaria*) Gundlach.
- Paectes devincta** Walker  
(as *Ingura vittata* Möschler 89-171, TYPE from Porto Rico)  
Gundlach, "Solamente conocida de Puerto Rico."



**Paectes arcigera** Guenee

(as *Ingura*) Stahl. Möschler. Gundlach.

**Paectes obrotunda** Guenee

(as *Ingura elegans* Möschler 89-170, TYPE from Porto Rico) Gundlach.

at light at Guánica (634-13 det. Schaus).

**Stictoptera vitrea** Guenee

Stahl. Möschler. Gundlach.

**Stictoptera penicillum** Herr. Sch.

Stahl. Möschler. Gundlach, "La oruga vive en *Parksonia aculeata* y en *Posppigia procera*."

**Charcoma nilotica** Rogenh.

(as *Paraxia chamaelon* Möschler 89-121, TYPE from Porto Rico) Gundlach.

at light at Guánica (608-13 det. Dyar); larvae, semi-transparent greenish-white, feeding on buds and webbing together small leaves of "sauce," Humbolt's willow, at Aguadilla (23-22 det. Schaus).

**Leianophera transfossa** Möschler 89-136, fig. 16, TYPE from Porto Rico.

Gundlach.

**Casandria abseuzalis** Walker

(as *Pleurasympieza smithii* Möschler 89-147, fig. 18, TYPE from Porto Rico) Gundlach.

one adult at light at Guánica (610-13 det. Dyar).

**Casandria elota** Möschler 89-145 (as **Collomena**), TYPE from Porto Rico.

(as *Collomena*) Gundlach.

**Iscadia aperta** Walker

(as *Encalypta schildei* Möschler 89-148, TYPE from Porto Rico) Gundlach.

**Achaea ablunaris** Guenee

(as *Ophisma ablunaris* Guenee, var. *hilaris* Möschler 89-202, TYPE from Porto Rico) Gundlach. Stahl.

**Ophisma tropicalis** Guenee

Stahl. Möschler. Gundlach, "Oruga en *Cupania*."

**Mocis marcida** Guenee—det. Schaus.

A black spot nearly 1 mm. in diameter on inner margin of forewings, near base.

at light (196-11, 1016-16 det. Schaus); larvae feeding on cowpeas (52-21).

**Mocis megas** Guenee

The black spot very small or absent.

(as *Remigia*) Stahl. Möschler. Gundlach.

at light (54-17), at Mameyes (192-13 det. Dyar), at Guánica (563-13).

**Mocis repanda** Fabr.

(as *Remigia latipes* Guenee) Stahl.

(as *R. latipes* Guen. and as *R. repanda* Fabr., not in synonymy) Möschler. Gundlach.

(as *Remigia*) Van Z. (1507) on millet and grasses.

(as *Remigia*) Jones 13-230 to 236: with *Laphygma frugiperda* S. & A. attacking young sugar cane and malojillo grass, *Panicum barbinode*, at Río Piedras, Mameyes and Cayey, La Plata.

(as *Remigia*) Van Dine 13-257; Van Dine 13-31; Jones 14-462: as a pest of sugar cane, larvae feeding on the leaves.

Smyth 19-144: on sugar cane and grasses.

Wolcott 21-38: larvae parasitized by *Euplectrus* sp. at Morovis.

Jones & Wolcott 22-49: the most complete account, description of all stages and parasites noted: *Phorocera claripennis* Macq., *Linnaemyia fulvicauda* Walton, *Helicobia helicis* Towns., *Chalcis* near *robusta* Cress. (*C. robustella* Wölc.) and *Rogas* sp. attacking the larvae, and *Sarcophaga sternodontis* Towns. reared from the pupa.

at light (1124-16, 82-19, 90-21), at Guánica — very common — (606-13): pupa in *Ipomoea* leaf (148-12): larvae on sugar cane (24-12), at Mameyes (811-12, 841-12), at Guayama (202-12), at Santa Isabel (209-11), at Fortuna (31-12), at Guánica (659-14, 24-15), at Barceloneta (E. D. Colón, Nov. 1922); on malojillo grass, *Panicum barbinode*, (24-12), at Arecibo (160-19); in pasture at Cabo Rojo (437-21).

**Phurys immunis** Guenee

Stahl. Möschler. Gundlach.

(One unlabeled specimen — det. Schaus.)

**Phurys helvina** Guenee

Stahl. (as *P. helveola* Herr. Sch.) Möschler. Gundlach.

**Nymbis garnoti** Guenee

(as *Phurys*) Stahl. Möschler. Gundlach.

**Safia acharia** Cramer

(as *Yrias*) Möschler. Gundlach.

**Zale setipes** Guenee

(as *Xylis*) Stahl. Möschler. Gundlach.

**Zale exhausta** Guenee

(as *Homoptera*) Möschler. Gundlach.

**Zale fictilis** Guenee

(as *Homoptera*) Möschler. Gundlach.  
at light (944-16 det. Schaus).

**Zale lunata** Drury

(as *Homoptera*) Möschler. Gundlach.

**Zale terrosa** Guenee—det. Schaus.

at light (944-16).

**Zale obsita** Guenee

(as *Homoptera*) Stahl.

**Decalea infusa** Walker

Möschler. Gundlach.

**Syngrapha egena** Guenee—det. Schaus.

larva on shade tobacco at Cayey (7-23).

**Syngrapha egenella** Herr. Sch.

(as *Plusia*) Möschler. Gundlach.

**Phytometra verruca** Fabr.

(as *Plusia*) Möschler. Gundlach.

larvae on purslane (149-12), on *Hyptis capitata* (363-16  
det. Schaus 315-16, 987-16).

**Phytometra ni** Hübner

at light at Guánica (650-13 det. Schaus).

**Phytometra calceolaris** Walker

(as *Plusia*) Möschler. Gundlach, "La oruga en *Commelyna*."

**Phytometra oo** Cramer

(as *Plusia binotula* Herr. Sch.) Stahl.

(as *Plusia rogationis* Guenee) Stahl. Möschler. Gundlach. Cotton 18-311: as a pest on tomato, notes and control. Wolcott 22c-14: a pest on tobacco and tomato, notes and control, "el Argrimensor Verde".

at light (937-16, 582-17), at Vega Baja (497-16), at Guánica (681-13); larvae on tomato (175-16, 1-16, 117-22); on tobacco at Cayey (327-17); on beans (608-17), on sweet potatoes (122-17).

QUADRIFINAE.

**Erebus odora** Linn.

Stahl. Möschler. Gundlach, "La oruga se alimenta de varias especies de *Cassia*, de *Pithecolobium* etc., ocultándose durante el día entre las grietas de la corteza." Van Z. (1418) on *Cassia fistula*, *Pithecolobium saman* and *Ficus* sp.

adults found in the laboratory in the morning (747-13, 981-13, 570-16, 539-19).

**Letis atricolor** Guenee  
Möschler. Gundlach.

**Letis mycerina** Fabr.—det. Schaus.

Wolcott 23-57: larva feeding on leaves of coffee.

in coffee grove at Adjuntas (486-21, 283-22), flying about in the dusk, snapping their wings together occasionally or struggling to copulate on the ground, at Ciales (462-21); larvae on coffee at Lares (425-21).

**Latebraria amphipyroides** Guenee  
Möschler. Gundlach, "Oruga en especies de *Cassia*."

**Peosina numeria** Drury  
Stahl. Möschler. Gundlach.

**Brujas rengus** Poey  
Möschler. Gundlach.

**Concana mundissima** Walker  
(as *Theliadora splendens* Möschler) Möschler. Gundlach.

**Eulepidotis addens** Walker—det. Dyar  
a small green leaf-folding caterpillar on *Inga vera* at Cayey (36-21).

**Eulepidotis superior** Guenee  
(as *Palinda dewitzii* Möschler 89-196, TYPE from Porto Rico)  
(as *Palinda*) Gundlach.

**Eulepidotis mabis** Guenee  
(as *Palinda*) Möschler. Gundlach.

**Eulepidotis hebe** Möschler (as *Palinda*) 89-195, TYPE from Porto Rico.  
(as *Palinda*) Gundlach.

**Eulepidotis striaepuncta** Herr. Sch.  
(as *Palinda variabilis* Möschler, var. *obscura* Möschler 89-195, TYPE of variety from Porto Rico) Gundlach.

**Eulepidotis rectimargo** Guenee  
Stahl.

**Eulepidotis inferior** Herr. Sch.  
Stahl.

**Eulepidotis modestula** Herr. Sch.  
(as *Palinda*) Möschler. Gundlach. Van Z. (P. R. 1406).  
common at light at Guánica (625-13 det. Dyar).

**Dyomyx junco** Möschler 89-197, TYPE from Porto Rico.  
Gundlach.

**Noropsis hieroglyphica** Cramer(as *Euglyphia fastuosa* Guenee) Stahl.(as *N. fastuosa* Guenee) Möschler. Gundlach, "Oruga en *Corchorus*."

Van Z. (P. R. 1421). Van Zwaluwenburg 18-33: on *Waltheria americana* and *Morongia leptoclada*. "The larvae are more or less gregarious and drop to the ground when distributed. The full grown larva is about 25 mm. long and about 4 mm. across the head. The ground color of the body is bluish or greenish white with a black stripe running around the body on each segment. The segments are divided from one another by a narrow black line. The anal plate and head are reddish-brown, the collar shiny black. The oval pupa case, about  $22 \times 10$  mm. is formed of parchment-like material on the stem of the food plant and is covered with grass and bits of leaves."

at light (612-12), very abundant at Guánica (550-13); reared from cocoon (162-12), very abundant on fence posts in cane fields at Yauco (330-21); larvae on *Waltheria americana* at Boquerón (16-23).

**Pseudohemiceras krugii** Möschler 89-176, TYPE from Porto Rico.

Gundlach.

at light at Guánica (564-13 det. Dyar); larvae boring in twigs of roble, *Tecoma pentaphylla* (831-16).

**Hemicephalis characteria** Cramer

Möschler. Gundlach.

**Melipotis fasciolaris** Hübner(as *Bolina*) Möschler. Gundlach.

at light at Guánica (677-13 det. Schaus).

**Melipotis contorta** Guenee(as *Bolina striolaris* Herr. Sch.) Stahl. Möschler.(as *Bolina*) Gundlach.**Melipotis ochrodes** Guenee(as *M. manipularis* Guenee) Van Z. (P. R. 1435).

common at light at Guánica (582-13 det. Dyar, 1060-13); pupa in crevice in leguminous tree at Fajardo (21-15); larvae in hole nearly covered with bark in leguminous tree at Central Mercedita (74-22); larvae in crevices in bark of algarroba trees (*Prosopis juliflora*, *P. glandulosa* and *P. pubescens*) or under trash at the base of trees at Guánica (412-14, 426-14, 452-14, 499-14).

**Melipotis januaris** Guenee

(as *Bolina* and as *B. russaris* Guenee, not in synonymy) Möschler. Gundlach, "Esta especie varía mucho, v. g. var. *limitata*, var. *bimaculata*, var. *confusa* Möschler."

Van Zwaluwenburg 18-34: Thousands of the larvae on guama, *Inga laurina*, at Mayagüez in June, 1917; pupated in the ground.

**Melipotis rectifasciata** Herr. Sch.

(as *Bolina*) Möschler. Gundlach.

**Melipotis leucomelana** Herr. Sch.

(as *Bolina*) Möschler. Gundlach.

**Melipotis nigrescens** Grote & Robinson, var. **ochreipennis** Harvey

(as *Bolina*) Möschler. Gundlach.

**Melipotis acontioides** Guenee = **sinualis** Harvey — det. Watson

at light at Guánica (1058-13).

**Epidromia pannosa** Guenee

(as *E. rotundata* Herr. Sch.) Stahl.

Möschler. Gundlach.

**Thermesia gemmatilis** Hübner

Stahl. Möschler. Gundlach.

(as *Anticarsia*) Cotton 18-293: larva destructive to velvet beans and cowpeas, notes and control.

at light (832-16), at Guánica (660-13); larvae on *Phaseolus mar* (866-14, 876-14), on foliage of gallito trees, *Agati grandiflora* (974-16).

**Thermesia elegantula** Herr. Sch.

Möschler. Gundlach, "Es probable que esta y la especie preecedente sean iguales." "A form of the preceeding." Schaus.

**Pangrapta repugnalis** Hübner

(as *Azeta*) Stahl. Möschler. Gundlach.

**Bendis formularis** Hübner

(as *B. impar* Guenee) Stahl.

Möschler. Gundlach, "La oruga se ería en *Cassia obtusifolia*." at light (52-17), at Guánica (1065-13 det. Schaus).

**Bendis magdalia** Guenee

Möschler. Gundlach.

**Aluaca flavicapilla** Möschler (as **Diastema**) 89-162, TYPE from Porto Rico.

(as *Diastema*) Gundlach.

larvae on *Agati grandiflora* (205-12 det. Dyar as *A. agilaria* Druce).

**Yrias progenies** Guenee

Möschler. Gundlach. Van Z. (P. R. 1408).

at light at Guánica (603-13 det. Dyar).

**(Celaeno amoides** Herr. Sch.

Stahl.)

**Toxonprucha diffundens** Walker

(as *T. amoena* Möschler 89-198, fig. 1, TYPE from Porto Rico) Gundlach.



**Capnodes anhypha** Guenee  
Möschler. Gundlach.

**Capnodes prisca** Möschler 89-216, TYPE from Porto Rico.  
Gundlach.

**Capnodes sterope** Cramer  
Möschler. Gundlach.

**Capnodes astyla** Möschler 89-215, TYPE from Porto Rico.  
Gundlach.

**Capnodes priscilla** Möschler 89-216, TYPE from Porto Rico.  
Gundlach.

**Capnodes turtur** Felder & Rogenhf., var. **insularis** Möschler 89-215,  
TYPE of variety from Porto Rico.  
Gundlach.

**Selenis portoricensis** Möschler 89-214, TYPE from Porto Rico.  
Gundlach.  
larva on *Aeschynomene sensitiva* (882-14 det. Schaus).

**Selenis suero** Cramer  
(as *S. sueroides* Guenee) Stahl.  
Möschler. Gundlach.  
(One unlabeled specimen — det. Schaus.)

**Orodesmia apicina** Herr. Sch.  
Stahl.

**Baniana significans** Walker  
Möschler. Gundlach.  
at light at Guánica (1067-13 det. Schaus).

**Focilla angularis** Möschler  
Möschler. Gundlach.

**Ephyrodes cacata** Guenee  
Möschler. Gundlach.

**Syllectra ericata** Cramer  
Möschler. Gundlach.  
(One unlabeled specimen — det. Dyar).

**Syllectra lucifer** Möschler 89-210, TYPE from Porto Rico.  
Gundlach.

**Syllectra congemmalis** Hübner  
(as *S. ficitillina* Möschler) Möschler. Gundlach.

**Parachabora abydas** Herr. Sch.—det. Schaus.  
at light at Guánica (674-13).

**Alabama argillacea** Hübner

(as *Anomis*) Stahl. Möschler. Gundlach.

Van Z. (1401) on cotton.

Wetmore 16-119: eaten by Mozambique.

Barrett 06-23: "destructive in small areas (in 1905) throughout a large cotton plantation (near Aguadilla) --- the pupae nearly all parasitized by *Chalcis annulata* Fabr."

May 06-11: "caused serious injury in a great many fields."

Smyth 20-122: an outbreak in the Hatillo district during July 1919.

Wolcott 23-59: not observed in 1921.

larvae on cotton in large numbers at Hatillo (510-19), during 1922 at Vega Baja (207- June, 1922), at Hatillo in August (206-22), very abundant in September in a few fields, had disappeared in October (329-22), at about the same time at Boquerón, a few parasitized pupae being found in January 1923 (23-23). The small larvae are killed by *Apanteles aletiae* Riley, the pupae by *Chalcis incerta* Cresson and *Sarcophaga sternodontis* Towns.

**Anomis doctorium** Dyar

(as *Alabama argillacea* Hübner on *Urena lobata*) Smyth 20-122: recommends the destruction of *Urena lobata* to eliminate the alternate host of the cotton caterpillar, but the moths he reared prove to be *Anomis doctorium* Dyar (694-16).

Wolcott 23-59: larvae on cotton.

larvae on cotton at Humacao (435-21), at Guayama (515-22), at Villalba (553-21), at Guánica (335-21, 434-21), at Camuy (226-21 det. Dyar), at Manatí (555-21), at Vega Baja and Garrochales (332-22); on *Urena lobata* (694-16); (on *Malachra rotundifolia* (969-16), no specimen in the collection and identification doubtful).

**Anomis fulvida** Guenee

Stahl. Möschler. Gundlach.

**Anomis illita** Guenee

Möschler. Gundlach.

**Anomis praerupta** Möschler 89-173. TYPE from Porto Rico.

Gundlach, "No está indicada de otras tierras."

**Anomis editrix** Guenee

Stahl. Möschler. Gundlach, "La oruga se cría en *Triumphetta*."

larvae on *Triumphetta* sp. (800-16 det. Watson).

**Cosmophila erosa** Hübner

Stahl. Möschler. Gundlach, "La oruga se cría en *Plumbago*, también en las *Althea*."

resting on cotton at Sabana Grande (504-22), at light at Guánica (1084-13 determined by Dr. Watson and by Mr. Schaus).

**Plusidonta thomae** Guenee

Möschler. Gundlach.

**Oraesia metallescens** Guenee

Möschler. Gundlach.

**Oraesia aequalis** Walker

Möschler. Gundlach.

**Pseudocalpe tristriga** Herr. Sch.

Möschler. Gundlach.)

**Gonodonta hesione** Drury

Möschler. Gundlach.)

**Gonodonta latimacula** GueneeMöschler. Gundlach, "Oruga en *Artanthe* y *Potomorphe*."**Gonodonta maria** GueneeStahl. Möschler. Gundlach, "Oruga en *Anona glabra* y *palustris*, *Bocagea virgata*, *Nectandra*."**Gonodonta nitidimacula** Guenee—det. Dyar

larva feeding on leaves of unidentified tree (165-21, 174-21), on *Piper medium* (176-21), at Cayey (384-22). Larva is entirely velvety black, except for yellow clypeus, two bright yellow semi-circular spots on the sides of the first segment, two narrow reddish-orange spots on the fourth segment and two small yellow spots dorsally, two small reddish-orange spots on the sides of the seventh segment, four larger on the eighth, two large ones on the ninth and tenth and two small ones on the eleventh, all lateral, and two large crescents on the hump of the twelfth, dorsally. Adult has a white head and black eyes and a large yellow spot in the middle of each hind wing, elsewhere brown, the forewings variegated with purple.

**Gonodonta soror** Cramer

Stahl. Möschler. Gundlach.

**Gonodonta uxor** Cramer

Stahl.

**Gonodonta teretimacula** GueneeStahl. Möschler. Gundlach, "La oruga come *Artanthe*."**Ophideres gubernatrix** Guenee

Möschler. Gundlach.

**Cocytodes schneideriana** Cramer—det. Schaus.

at light (209-16).

**Hybloea puera** Cramer

Stahl. Möschler. Gundlach. Van Z. (P. R. 124).

at light (587-22); larvae feeding on leaves of roble trees, *Tecoma pentaphylla* (199-17 det Schaus), in great abundance at Guaynabo (586-22), at Comerío (388-22).

## HYPENINAE.

**Phiprosopus albigutta** Herrick-Schaeffer—det. Schaus.

larvae abundant on undetermined host at Boquerón (110–23). Looper caterpillars, about 30 mm. long, grey in general appearance, due to irregular, waved, longitudinal, narrow stripes of yellow, or orange edged with yellow, alternating with broader stripes of greyish lavender margined with darker lavender. Two pairs of prominent yellow warts on the most elevated abdominal segments, covered with short fine brown hairs. Setae and their bases black. Head creamy and opalescent, with rows of aggregations of orange-yellow dots and dark brown ocelli, mouth-parts creamy and opalescent.

Cocoons of light yellow silk, thick and roughly quadrangular,  $6 \times 20$  mm.

Adults with considerable variation, but with a diagonal stripe, cream-colored, or dark brown, from apical angle to about the middle of the inner margin of forewings constant.

**Tortricodes orneodalis** Guenee—det. Schaus.

at light at Guánica (679–13); larva on tomato (173–16).

**Rivula pusilla** Möschler 89–234, TYPE from Porto Rico.

Gundlach.

**Lophoditta tuberculata** Herr. Sch.

(as *L. perspicillaris* Möschler 89–231, TYPE from Porto Rico)

Gundlach.

**Mastigophorus dimissalis** Möschler 89–233, TYPE from Porto Rico.

Gundlach.

**Physula peckii** Möschler 89–232, TYPE from Porto Rico.

Gundlach.

**Phlyctaina irrigualis** Möschler 89–229, TYPE from Porto Rico.

Gundlach.

**Tetanolitha mutatalis** Möschler (as **Scelescepon**) 89–230, TYPE from Porto Rico.

(as *Scelescepon*) Gundlach.

(One unlabeled specimen — det. Schaus).

**Zagorista debora** Druce—det. Schaus.

larvae on leaves of *Caperonia palustris* (379–16, 886–16).

**Palinthis clanymoides** Möschler (as **Lophophora**) 89–228, TYPE from Porto Rico.

(as *Lophophora*) Gundlach.

**Bleptina caradrinalis** Guenee

(as *B. subjecta* Möschler 89–226, TYPE from Porto Rico) Gundlach.

**Bleptina acastusalis** Walker

(as *Anagoa nigromaculalis* Möschler 89-218, and *A. placidalis* Möschler 89-219, TYPES from Porto Rico) Gundlach.

**Bleptina menalcasalis** Walker

(as *Anagoa limatalis* Möschler 89-218, TYPE from Porto Rico) Gundlach.

**Aglaonice hirtipalpis** Walker

(as *A. snelleni* Möschler 89-227, TYPE from Porto Rico) Gundlach.

**Mursa gracilis** Möschler (as **Sisputa**) 89-222, TYPE from Porto Rico.

(as *Sisputa*) Gundlach.

**Hormoschista orba** Grote

(as *H. pagenstecheri* Möschler 89-221, TYPE from Porto Rico) Gundlach.

**Bomolocha exoletalis** Guenee

(as *Hypena*) Möschler. Gundlach.

**Bomolocha umbralis** Smith

(as *Hypena cervinalis* Möschler 89-223, TYPE from Porto Rico) Gundlach.

**Bomolocha conditalis** Möschler (as **Hypena**) 89-222, TYPE from Porto Rico.

(as *Hypena*) Gundlach.

"probably the same as *vetustalis* Guenee." Schaus.

**Anepischetos lividalis** Hübner

(as *Hypena*) Möschler. Gundlach.

**Anepischetos porrectalis** Fabr.

(as *Hypena incertalis* Möschler 89-225, TYPE from Porto Rico) Gundlach.

**Anepischetos degesalis** Walker

(as *Hypena vincularis* Möschler 89-224, TYPE from Porto Rico) Gundlach.

**Carteris oculatalis** Möschler (as **Zanclognatha**) 89-225, TYPE from Porto Rico.

(as *Zanclognatha*) Gundlach.

**Metalla variabilis** Möschler 89-220, TYPE from Porto Rico. Gundlach.

PERICOPIDÆ (HYPSIDÆ).

**Lauron vinosa** Drury

Dewitz. Stahl. Möschler. Gundlach, "La oruga en *Tournefortia* y *Heliotropium*."

Van Z. (P. R. 123) on *Heliotropium indicum*.

Jones, Thos. H., "Some Notes on the Life History and Habits of *Lauron vinosa* Drury" in *Insecutor Inseitie Menstruus*, Vol. 2, No. 7, 1914, pp. 108-111; description of all stages.

(26-12, 521-12, 953 to 958-13, 976-13, 977-13, 986-13, 989-13, 469-16).

**Composia fidelissima** Herr. Schaffer—det. Schaus.

at light at Arecibo (149-13); flying about in bright sunlight and feeding at *Lantana* flowers in opening in palm grove on the beach at Mameyes (337-22).

**Composia subcyanea** Walker—det. Dyar

on grass and weeds in abandoned coffee grove in mountains north of Yauco (246-22).

**Composia sybaris** Cramer

Dewitz. Stahl. Möschler. Gundlach.

#### NOTODONTIDÆ.

**Nystalea ebalea** Cramer

Möschler. Gundlach, "La oruga vive en *Comocladia* y en *Spondias*."

**Nystalea nyseus** Cramer

(as *Cyrrhaesta*) Dewitz. Stahl.

Möschler. Gundlach.

**Proelymiotis aequipars** Walker

(as *Nystalea divisa* Möschler) Möschler. Gundlach.

**Edema insularis** Grote

Dewitz. Möschler. Gundlach, "La oruga se cría en *Cupania*."

**Rifargia distinguenda** Walker

(as *Symmerista dubia* Möschler) Möschler. Gundlach.

#### EPIPLEMIDÆ.

**Nedusia excavata** Möschler 89-244, TYPE from Porto Rico.

Gundlach.

**Syngria reticularis** Möschler 89-256, TYPE from Porto Rico.

Gundlach.

**Syngria ramosaria** Möschler 89-256, TYPE from Porto Rico.

Gundlach.

**Cerasympniasta marsitata** Möschler 89-261, TYPE from Porto Rico.

Gundlach.

**Cerasympniasta sanata** Möschler 89-262, TYPE from Porto Rico.

Gundlach.

**Erosia ineptaria** Möschler 89-262, TYPE from Porto Rico.

Gundlach.



**Erosia excludaria** Möschler 89-262, TYPE from Porto Rico.  
Gundlach.

**Erosia obvallataria** Möschler 89-263, TYPE from Porto Rico.  
Gundlach.

GEOMETRIDÆ.

**Phrygonis argentata** Drury  
(as *Eulepidotus*) Möschler. Gundlach.

**Phrygonis cultaria** Hübner  
(as *Eulepidotus*) Stahl. (as *E. paradoxata* Guenee, determination doubtful) Möschler. Gundlach.

**Phrygonis polita** Cramer.  
Möschler. Gundlach.  
"Probably all three species wrongly identified." Schaus.

**Chrysocestis fimbriaria** Cramer  
Möschler. Gundlach.

**Stegania subpusaria** Herr. Sch.  
Möschler. Gundlach.

**Numia terebintharia** Guenee  
(and as *Numia buxaria* Guenee, not in synonymy) Möschler.  
Gundlach.

**Syrrhoedia decrepitaria** Hübner  
(as *Acroleuca*) Stahl. Möschler. Gundlach.

**Casbia** sp. nov.—det. Schaus.  
(Specimens in National Museum.)

**Semiothisa enotata** Packard  
Möschler. Gundlach.  
(One unlabeled specimen — det. Schaus).

**Semiothisa infimata** Guenee  
Möschler. Gundlach.

**Semiothisa diffusata** Guenee—det. Dyar  
at light at Guánica (627-13).

**Semiothisa bisignata** Möschler 89-248, TYPE from Porto Rico.  
Gundlach.

**Semiothisa cellulata** Herr. Sch.  
Möschler. Gundlach.

**Semiothisa** sp.—det. Schaus  
larvae defoliating flamboyant, *Poinciana regia* (827-16), at  
Guánica (209-15).

**Apicia distycharia** Guenee  
Möschler. Gundlach.

**Moschleria hulstii** Möschler 89-235, TYPE from Porto Rico.  
Gundlach.

**Drepanodes ephyrata** Guenee  
Möschler. Gundlach.

**Drepanodes infensata** Guenee  
Möschler. Gundlach.

**Sericoptera mahometaria** Herr. Sch.  
Stahl.

**Sericoptera area** Cramer  
Möschler. Gundlach.

**Nepheloleuca politia** Cramer  
(as *Urapteryx*) Stahl. (as *Urapteryx* and as *U. complicata*  
Guenee, not in synonymy) Möschler. Gundlach.  
(Three unlabeled specimens — det. Schaus).

**Microgonia vesulia** Cramer  
(as *Oxydia quadriagliata* Guenee) Stahl.  
(as *Oxydia*) Möschler. Gundlach, "Estas especies varían muchísimo. Möschler describe diez variedades."  
Van Z. (P. R. 1450).  
at light at Guánica (566-13 det. Dyar); larva, a large grey  
looper, on leaves of wild orange at Cayey (35-21) pupated in  
slight cocoon; larva on *Acalypha wilkesiana* (9-19).

**Certima dositheata** Guenee  
(as *Microgonia*) Möschler. Gundlach.

**Azelina vetustaria** Walker—det. Schaus.  
(One unlabeled specimen.)

**Pero rectisectaria** Herr. Sch.  
Möschler. Gundlach.

**Pero curvistrigaria** Herr. Sch.  
Stahl.

**Thysanopyga apicitruncaria** Herr. Sch.  
Möschler. Gundlach.

**Brothis vulneraria** Hübner  
Stahl. Möschler. Gundlach.

**Alcis momaria** Guenee  
(as *Boarmia*) Möschler. Gundlach.  
(One unlabeled specimen — det. Schaus).

**Alcis abjectaria** Herr. Sch.  
(as *Boarmia*) Möschler. Gundlach.

**Alcis delicata** Butler  
(as *Boarmia*) Möschler. Gundlach.

**Alcis hilararia** Möschler (as **Boarmia**) 89-266, TYPE from Porto Rico.  
(as *Boarmia*) Gundlach.

**Bronchelia pudicaria** Guenee  
(as *Boarmia*) Stahl. Möschler. Gundlach.

**Bronchelia scolopacea** Drury  
(as *Boarmia*) Möschler. Gundlach.

**Amphidasys arnobia** Cramer  
(as *Thyrinitea quadricostaria* Herr. Sch.) Möschler. Gundlach.

**Bombycodes simplicaria** Guenee  
Möschler. Gundlach.

**Melanchroia geometroides** Walker  
Stahl.

**Melanchroia cephise** Cramer  
Van Z. (1663) on *Phyllanthus lathyroides*.  
Van Zwaluwenburg 15-31: "a local outbreak at Camuy, where the larvae practically stripped the grosella trees, *Phyllanthus distichus*."  
on weeds in cane fields (105-12, 828-16), at flowers of *Mitrocarpus portoricensis* (719-14 det. Dyar), at flowers of *Heliotropium* at Añasco (507-13); larvae on *Phyllanthus lathyroides* (718-14, 720-14, 316-16, 327-16, 548-16).

**Hydratoscia fenestraria** Guenee—det. Dyar  
Van Z. (1601) on *Genipa americana*.  
larvae on leaves of unidentified tree (175-21) have dark purplish-brown head and five large irregularly rectangular spots of this color on the anterior abdominal segments, alternating with areas of dull green (the ground color) of approximately the same size, with small purplish spots on the second and third thoracic segments, and smaller purplish spots on the other segments.

**Cnemodes perletaria** Möschler 89-240, TYPE from Porto Rico.  
Gundlach.

**Cnemodes malefidaria** Möschler 89-240, TYPE from Porto Rico.  
Gundlach.

**Zonosoma occipitraria** Herr. Sch.  
Stahl. Möschler. Gundlach.

**Zonosoma delectabiliaria** Möschler 89-236, TYPE from Porto Rico.  
Gundlach.

**Hyria opulentaria** Möschler (as **Acidalia**) 89-237, TYPE from Porto Rico.  
(as *Acidalia*) Gundlach.

- Hyria flavomarginata** Möschler (as **Acidalia**) 89-237, TYPE from Porto Rico.  
(as *Acidalia*) Gundlach.
- Idaea chionaeata** Herr. Sch.  
(as *Acidalia*) Stahl. Möschler. Gundlach.  
(One unlabeled specimen — det. Schaus).
- Idaea eburneata** Guenee  
(as *Acidalia*) Möschler. Gundlach.
- Idaea tortuosaria** Möschler (as **Acidalia**) 89-237, TYPE from Porto Rico.  
(as *Acidalia*) Gundlach.
- Ptychopoda offendata** Möschler (as **Acidalia**) 89-238, TYPE from Porto Rico.  
(as *Acidalia*) Gundlach.
- Craspedia crenatilineata** Warren—det. Schaus.  
(One unlabeled specimen.)
- Pleuroprucha molitaria** Möschler 89-238, TYPE from Porto Rico.  
Gundlach.
- Hemiptilota insulsaria** Guenee—det. Schaus.  
from pupa on cane leaf at Yauco (259-21).
- Leptostales oblinataria** Möschler 89-239, TYPE from Porto Rico.
- Leptostales devolutaria** Möschler 89-239, TYPE from Porto Rico.
- Leptostales praepeditaria** Möschler 89-239, TYPE from Porto Rico.
- Leptostales mutuataria** Möschler 89-239, TYPE from Porto Rico.
- Leptostales tumidaria** Möschler 89-240, TYPE from Porto Rico.
- Leptostales instutaria** Möschler 89-240, TYPE from Porto Rico.  
Gundlach.  
"Most of these names are probably synonyms." Schaus.
- Apallacta pryrrhularia** Möschler 89-242, TYPE from Porto Rico.  
Gundlach.
- Calyptocoma phorcaria** Guenee  
(as *Zonosoma*) Möschler. Gundlach.
- Racheospila confundaria** Möschler 89-242, TYPE from Porto Rico.  
Gundlach.
- Racheospila ocellata** Stoll  
Möschler. Gundlach.
- Phrudocentra centrifugaria** Herr. Sch.  
(as *Racheospila anomalaria* Möschler 89-243, TYPE from Porto Rico) Gundlach.

**Eucrostis albocostaria** Herr. Sch.  
Stahl. Möschler. Gundlach.

**Geometra attendaria** Möschler 89-243, TYPE from Porto Rico.  
Gundlach.

**Scordylia quadruplicaria** Hübner  
Möschler. Gundlach.

**Cambogia snellenaria** Möschler  
(as *Asthena*) Möschler. Gundlach.

**Pterocypha praecurraria** Möschler (as **Spargania**) 89-269, TYPE  
from Porto Rico.  
Gundlach.

**Pterocypha defensata** Walker—det. Schaus.  
(One unlabeled specimen.)

**Rhopalodes castniata** Guenee  
Möschler. Gundlach.  
"Probably wrong." Mr. Schaus.

**Cidaria aristata** Herr. Sch.  
Möschler. Gundlach. (as *Larentia*) Stahl.

**Cidaria baliata** Herr. Sch.  
Möschler. Gundlach.

**Cidaria balteolata** Herr. Sch.  
Möschler. Gundlach. (as *Larentia*) Stahl.

**Cidaria elutata** Herr. Sch.  
(as *Larentia*) Stahl.

**Cidaria chloronotata** Möschler 89-273, TYPE from Porto Rico.  
Gundlach.

**Cidaria vinacea** Möschler 89-274, TYPE from Porto Rico.  
Gundlach.

**Terenodes aureocapitaria** Möschler 89-274, TYPE from Porto Rico.  
Gundlach.

(**Terenodes mirandilis**  
Stahl.)

**Syllexis intamiataria** Möschler 89-241, TYPE from Porto Rico.  
Gundlach.

**Mecoceras nitocris** Cramer  
Möschler. Gundlach.

**Almodes squamigera** Felder  
(as *Boarmia*) Möschler. Gundlach.  
"not found in P. R." Mr. Schaus.

## PSYCHIDÆ.

**Oeceticus kirbyi** Guilding

Möschler. Gundlach, "La oruga vive sobre *Persea*, *Cupania*, *Terminalia*, etc."

## MEGALOPYGIDÆ.

**Megalopyge krugii** Dewitz (as **Lagoa**) 77-95, TYPE from Porto Rico. (as *Megalopyga*) Möschler 89-122. Gundlach 91-465 (No. 148).

Van Z. (1662) on *Inga vera*, *Terminalia catappa* and coffee.

Van Zwaluwenburg 15-31: on guama, *Inga laurina*, and coffee.

Van Zwaluwenburg 15-34: "The larva is covered with long white hairs and is provided with brittle spines which cause a burning sensation if allowed to come in contact with the skin. The pupa-case, with a 'trap-door' exit at one end,  $16 \times 10$  mm., is formed of the hairs of the larva mixed with a substance secreted by the mature larva."

at light at Guánica (565-13); larvae on grapefruit (106-16), on guava, *Psidium guajava* (38-21 parasitized by *Chalcis robustella* Wolc.); on mangrove and *Conocarpus erectus* at Martin Peña (142-23); on cacao at Ciales (470-21); cocoons very abundant on the trunks of *Erythrina glauca* trees at Cayey, and common on coffee, *Inga vera* and *Inga laurina* throughout the coffee districts. (GNW) Larva known as "plumilla". The old cocoons furnish shelter for small spiders and many small insects, especially cockroaches and ants.

## THYRIDIDÆ.

**Rhodoneura scallula** Guenee (as **Striglina**) var. **immaculata** Möschler 89-122, TYPE from Porto Rico.

(as *Striglina*) Gundlach 91-465 (No. 149).

## PYRALIDÆ.

## PYRAUSTINÆ.

**Homophysa banderiana** Fabr.

(as *H. dolatalis* Möschler 89-321, TYPE from Porto Rico) Gundlach.

**Lipocosma hebescalis** Möschler 89-316, TYPE from Porto Rico. Gundlach.

"Probably not a *Lipocosma* and does not belong here." Mr. Schaus.

**Zinckenia fascialis** Cramer

(as *Z. recurvalis* Fabr.) Stahl. Möschler. Gundlach, "La oruga se cría en *Amaranthus* y *Celosia*."

Van Z. (P. R. 1409). Jones 15-8: on *Amaranthus*.

Cotton 18-280: "webbing and skeletonizing the leaves of beets." common at light at Guánica (609-13 det. Dyar); larvae on *Amaranthus* (546-12, 703-17), at Guánica (214-15); on swiss chard (550-17).



**Zinckenia perspectalis** Hübner

Möschler. Gundlach. Van Z. (P. R. 1437).

common at light at Guánica (598-13 det. Dyar); larvae on *Synedrella nodiflora* (366-16, 747-16, 1118-16), on *Eleutheranthera ruderalis* (399-16), on *Wedelia trilobata* (774-16, 881-16), on *Melanthera canescens* (799-16), on *Verbesina alba* (916-16) — all collections and rearings by E. G. Smyth.

**Pycnarmon receptalis** Walker

(as *Spilomela personalis* Herr. Sch.) Möschler. Gundlach.

**Desmia tages** Cramer

Stahl. (as *Desmia sertorialis* Herr. Sch.) Möschler. Gundlach.

**Desmia ufeus** Cramer

(as *Desmia orbalis* Guenee and as *Desmia viduatalis* Möschler 89-311, TYPE from Porto Rico) Möschler. Gundlach.

at Camuy (EGS); larvae on *Cissus sicyoides* (562-21 det. Schaus).

**Desmia nacialis** Snell

Möschler. Gundlach: possibly the female of *Desmia amillalis* Snell.

**Maruca testulalis** Geyer—det. Dyar

Cotton 18-279: as the "Bean Pod-Borer", notes and control.

(198-12, 792-12), common at light at Guánica (583-13); larvae on sword beans (868-14).

**Synclera traducalis** Zeller

Möschler. Gundlach. (as *Pagyda*) Van Z. (P. R. 1440).

at light at Guánica (607-13 det. Dyar).

**Ercta vittata** Fabr.

(as *Euclasta torquillalis* Möschler 89-302, TYPE from Porto Rico) Gundlach.

rare at light at Guánica (652-13 det. Schaus).

**Marasmia cochrusalis** Walker

(as *Cnaphalocrocis perpersalis* Möschler 89-293, TYPE from Porto Rico) Gundlach.

(One unlabeled specimen — det. Schaus).

**Syngamia florella** Cramer

Stahl. Möschler. Gundlach.

(669-12 det. Schaus); at Aibonito (SSC).

**Syngamia haemorrhoidalis** Guenee

(as *Salbia*) Möschler. Gundlach.

**Syngamia cognatalis** Snell

(as *Salbia*) Möschler. Gundlach.

**Syngamia praeformatalis** Möschler (as **Salbia**) 89-291, TYPE from Porto Rico.  
(as *Salbia*) Gundlach.

**Hileithia ductalis** Möschler 89-292, TYPE from Porto Rico.  
Gundlach.  
(One unlabeled specimen — det. Schaus).

**Samea ecclesialis** Guenee  
(as *Samea castellalis* Guenee) Stahl. Möschler. Gundlach.

**Trithyris quadrifenestalis** Herr. Sch.  
(as *Coenostola*) Möschler. Gundlach.

**Diastichtis argyralis** Hübner  
(as *Botys*) Stahl. Möschler. Gundlach.

**Pilocrocis lauralis** Walker  
(as *Spilomela pervialis* Herr. Sch.) Möschler. Gundlach.

**Pilocrocis tripunctata** Fabr.  
(as *Acrospila campalis* Guenee) Stahl. Möschler. Gundlach.  
Jones 15-9: "Sweet-potato leaves --- webbed together and injured by the larva." Illustration of adult.  
Cotton 18-309: notes.  
larvae on sweet-potato (894-13, 723-17), on *Ipomoea bona-nox* (709-16).

**Pilocrocis infuscalis** Guenee  
(as *Botys pruinialis* Lederer) Möschler. Gundlach.

**Mesocondyla concordalis** Hübner  
(as *Acrospila*) Möschler. Gundlach.  
at light at Guánica (648-13 det. Dyar); larvae on leaves of calabash tree, *Crescentia cujete* (786-12, 934-16), at Ciales (596-21); on leaves of roble tree, *Tecoma pentaphylla* (26-14), at Dorado (544-22).

**Mesocondyla gastralis** Guenee  
(as *Acrospila*) Möschler. Gundlach.

**Conchylodes diphteralis** Hübner  
Stahl. (as *Ledereria*) Möschler. Gundlach, "La oruga en especies de *Cordia*, y la crisálida en su capullo, hace saltar este a distancia de algunas pulgadas."

**Dichogamma redtenbacheri** Lederer  
Möschler. Gundlach.  
three adults at light at Guánica (631-13 det. Dyar).

**Dichogamma amabilis** Möschler 89-296, TYPE from Porto Rico.  
Gundlach.

**Dichogamma innocua** Fabr.

(as *D. krugii* Möschler 89-296, TYPE from Porto Rico) Gundlach.

**Dichogamma bergii** Möschler 89-297, TYPE from Porto Rico.  
Gundlach.**Dichogamma fernaldi** Möschler 89-297, TYPE from Porto Rico.  
Gundlach.**Phostria prolongalis** Guenee

(as *Microthyris*) Möschler. Gundlach.

**Phostria humeralis** Guenee

(as *Omiodes*) Möschler. Gundlach.

**Phostria insolutalis** Möschler (as **Omiodes**) 89-301, TYPE from  
Porto Rico.  
(as *Omiodes*) Gundlach.**Phostria martyralis** Lederer

(as *Coenostola*) Möschler. Gundlach.

**Coenostola eruptalis** Lederer

Möschler. Gundlach.

**Lamprosema inabsconsalis** Möschler (as **Diasemia**) 89-306, TYPE  
from Porto Rico.  
(as *Diasemia*) Gundlach.**Lamprosema subulalis** Guenee

(as *Sisyracera preciosalis* Möschler) Möschler. Gundlach.

**Lamprosema zoilusalis** Walker

(as *Botys hilaralis* Möschler) Möschler. Gundlach.

**Lamprosema xanthialis** Guenee

(as *Botys incalis* Snell, var. *rosealis* Möschler 89-285, TYPE of the variety from Porto Rico) Gundlach.

**Lamprosema indicata** Fabr.

(as *Hedylepta vulgaris* Guenee) Stahl. Möschler. Gundlach,  
"La oruga se cría entre las hojas reunidas de plantas de la familia de las papilionáceas."

(as *Nacoleia*) Jones 15-9: larvae on beans and cowpeas. Illustration of adult. Cotton 18-278: as the "Bean Leaf-Webber." "The small dirty-green colored larva webs the leaves (of bean) together, living between them and skeletonizing them with its feeding." Control.

larvae on cowpeas (2-12), on beans (RTC), on *Lantana camara* (763-16), on *Meibomia tortuosa* (1091-16), on *Vigna repens* (1136-16); on peas and beans at Vega Baja (362-21), parasitized by *Argyrophylax albincisa* Wied., a Tachind fly.

**Lamprosema lunulalis** Hübner

Möschler. Gundlach.

**Sylepta gordialis** Guenee(as *Asciodes*) Stahl. Möschler. Gundlach.

larvae on leaves of Bougainvillea vine at Pt. Cangrejos

(GNW — det. Dyar).

**Sylepta titubalis** Möschler (as **Asciodes**) 89-303. TYPE from Porto Rico.(as *Asciodes*) Gundlach.**Sylepta scopulalis** Guenee(as *Asciodes*) Möschler. Gundlach.**Sylepta helcitalis** Walker(as *Crossophora miscellalis* Möschler 89-308, TYPE from Porto Rico) Gundlach.**Sylepta patagialis** Zeller(as *Herpetogramma servalis* Lederer) Möschler. Gundlach.**Sylepta silicalis** Guenee—det. Dyarlarva a leaf-roller on *Didymopanax morototoni* at Lares

(133-22).

**Sylepta elevata** Fabr.—det. Dyar

at light (394-16), at Guánica (595-13).

**Sylepta onophasalis** Walker—det. Schaus.

(One unlabeled specimen.)

**Sathria stercoralis** Lederer

Stahl. Möschler. Gundlach.

**Lygropia lelex** Cramer(as *Cyclosena gestatalis* Möschler 89-309, TYPE from Porto Rico) Gundlach.larva on *Ipomoea* sp. (564-21 det. Schaus).**Margaronia flegia** Cramer—det. Schaus.larva on *Thevetia thevetia* at Pt. Salinas (Plantaje) (695-16).**Margaronia aurocostalis** Guenee(as *Pachyarches*) Möschler. Gundlach.at light at Guánica (672-13 det. Schaus); larva on leaf of *Rauwolfia nitida*, folding over half of it to make a bag, in which it lived and on the interior of which it fed at Camuy (331-22).**Margaronia nitidalis** Cramer(as *Phacellura*) Möschler. Gundlach. (as *P. hylinasalis*) Stahl.

**Margaronia infernalis** Möschler (as **Phacellura**) 89-300, TYPE from Porto Rico.  
(as *Phacellura*) Gundlach.

**Margaronia hyalinata** Linn.  
(as *Phacellura*) Möschler. Gundlach, "La oruga se cría en curcubitaceas y también en *Ipomea*."  
(as *P. immaculalis* Guenee) Stahl.  
(as *Diaphania*) Barrett 03-448; Jones 16-8; Cotton 18-294; Van Z. (920) on Curcubitaceae.  
at light (51-12, 159-12, 24-19), at Guánica (602-13) very common; larvae on cucumbers (106-12, 547-12, 629-17, 633-17), on cantaloupe (286-16), on watermelon (314-16).

**Margaronia elegans** Möschler (as **Phacellura**) 89-299, TYPE from Porto Rico.  
(as *Phacellura*) Gundlach.

**Margaronia fuscicaudalis** Möschler  
(as *Phacellura*) Möschler. Gundlach.

**Margaronia lucidalis** Hübner  
(as *Phacellura*) Stahl. Möschler. Gundlach.

**Margaronia quadristigmalis** Guenee  
(as *Margarodes*) Möschler. Gundlach.  
at light at Guánica (672-13 det. Schaus).

**Margaronia isoscelalis** Guenee  
(as *Margarodes*) Möschler. Gundlach.

**Margaronia sibillalis** Walker  
(as *Glypodes*) Möschler. Gundlach.  
(Unlabeled specimens — det. Schaus); larva on *Morus alba* (410-22).

**Margaronia ausomia** Cramer  
(as *Hoterodes*) Stahl. Möschler. Gundlach.

**Diaphantia conspicualis** Möschler 89-314, TYPE from Porto Rico.  
Gundlach.

**Agathodes designalis** Guenee  
(as *Stenurges*) Möschler. Gundlach.  
larva on *Erythrina glauca* (869-16, 327-21 det. Dyar) rolling leaves and boring in stem; on *Citharexylum fructocosum* (15-17); fully grown larvae boring in bark of large *Erythrina glauca* and *Inga vera* trees at Cayey (381-22).

**Cliniodes semilunalis** Möschler 89-297, TYPE from Porto Rico.  
Gundlach.

**Syllepsis marialis** Poey  
Möschler. Gundlach.

**Leucinodes elegantalis** Guenee

Möschler. Gundlach.

at light (636-16, 197-17 det. Schaus).

**Ommatospila narcaeusalis** Walker(as *O. nummulalis* Lederer) Möschler. Gundlach.

(Unlabeled specimens — det. Schaus.)

**Hellula undalis** Fabr.

Möschler. Gundlach.

**Hellula phidilealis** Walker—det. Schaus

(One unlabeled specimen.)

**Epipagis conjunctalis** Möschler (as *Samea*) 89-290, TYPE from Porto Rico.(as *Samea*) Gundlach.**Epipagis togalis** Lederer(as *Botys*) Stahl. Möschler. Gundlach.**Terastia meticulosalis** Guenee—det. Schaus & Dyarlarvae bore in twigs of *Erythrina glauca* trees, ninety per cent of those in an experimental planting at the Station being infested (326-21).**Orobena implicitalis** Möschler 89-292, TYPE from Porto Rico.

Gundlach.

**Catacteniza (Azochis) euvexalis** Möschler 89-314, fig. 13, TYPE from Porto Rico.

Gundlach.

at light at Guánica (647-13 det. Schaus).

**Crocidophora huronalis** Guenee(as *Stenophyes serinalis* Walker) Möschler. Gundlach.

(810-14 det. Dyar), from Algarrobo (814-14).

**Psara periusalis** Walker(as *Pachyzancla*) Jones 15-9: "The young larvae live at first as miners in the leaves (of eggplant and *Solanum torvum*), but later web the leaves together." Notes and description of adult. Illustration of work. Cotton 17-109: "The Tobacco Leaf-Folder" — an extended account (5 pp.) with description of all stages, life-history and control. Cotton 18-299: as leaf-folder of eggplant, notes and control.

Wolcott 22c-10: "El Pega-Pega del Tabaco".

common at light at Guánica (663-17); larvae on *Solanum torvum* (176-12, 397-16, 796-16, 924-16), on eggplant (787-12, 984-16), on *Solanum nigrum* (376-16, 745-16), on tomato (189-15), on wild tomato (826-16), on tobacco (94-20), at Aguadilla (137-20), at Cayey (9-23), the most abundant insect on shade-grown tobacco, but less abundant on the sunny hills.



**Psara phaeopteralis** Guenee—det. Dyar

larvae abundant in pasture eating St. Augustine or "gramma" grass, *Stenotaphrum secundatum*, at Hatillo (224-21).

**Psara bipunctalis** Fabr.

(as *Botys detritalis* Guenee) Möschler. Gundlach.

(as *Pachyzancla*) Jones 15-8: on *Amaranthus*. Cotton 18-280: "on beets, chard and *Amaranthus*." Notes and control. Van Z. (P. R. 1438).

at light at Guánica (601-13, 661-13); larvae on *Amaranthus* (178-11, 219 to 223-11, 336-16, 355-16), on beets (408-13), on eggplant (1008-16), on swiss chard (551-17, 584-17, 589-17), on *Achrysanthes indica* (898-16), on *Borreria ocimoides* (380-16).

**Phlyctaenodes ? pertentalis** Möschler (as **Botys**) 89-284, fig. 7, TYPE from Porto Rico.

(as *Botys*) Gundlach.

**Phlyctaenodes ? placentalis** Möschler (as **Botys**) 89-285, TYPE from Porto Rico.

(as *Botys*) Gundlach.

**Phlyctaenodes viscendalis** Möschler (as **Botys**) 89-285, TYPE from Porto Rico.

(as *Botys*) Gundlach.

**Phlyctaenodes bifidalis** Fabr.

(as *Eurycreon evanadalis* Berg.) Möschler. Gundlach.

Van Z. (P. R. 1407).

common at light at Guánica (597-13, det. Dyar & Schaus).

**Phlyctaenodes nudalis** Hübner

(as *Eurycreon*) Möschler. Gundlach.

**Phlyctaenodes similalis** Guenee—det. Dyar

at light at Guánica (662-13).

**Phlyctaenodes collucidalis** Möschler (as **Eurycreon**) 89-290, TYPE from Porto Rico.

(as *Eurycreon*) Gundlach.

"Probably a variety of *similalis* Guenee." Mr. Schaus.

**Diasemia ramburialis** Dup., var. **minimalis** Möschler 89-306, TYPE of the variety from Porto Rico.

Gundlach.

**Sparagmia gigantalis** Guenee

Möschler. Gundlach.

larva on grayumbo macho, *Didymopanax morototoni* at Lares (159-22 det. Schaus).

**Mecyna glivata** Fabr.

(as *Botys polygonalis* Hübner) Möschler. Gundlach.

**Epicorsia mellinalis** Hübner(as *Botys oedipodalis* Guenee) Möschler. Gundlach.(as *Pyrausta*) Van Z. (P. R. 1411).

very common at light at Guánica (581-13 det. Dyar); larvae abundant on *Citharexylum fruticosum* and *Vitex divaricata* at Aibonito and Trujillo Alto (68-23). Fully-grown larvae semi-transparent green, 28-30 mm. long, with cadmium yellow head, on which are several small black spots subtending hairs. The first and last segments of the body with numerous small black spots, the other segments marked dorsally with four quite large black spots, irregularly oval, arranged in a square, each spot with a clear space near the center about the base of a hair; laterally a thick irregular black ring about the base of a hair above the spiracles, and below a narrower black ring around two black dots, each the base of hairs; ventrally a very narrow black ring around the black base of a hair and a group of three black-based hairs on each side of most segments. Legs transparent light yellow.

Cocoons of brown silk, of three distinct layers, formed in a folded-over leaf. Pupal period ten to twelve days.

**Epipagis cambogialis** Guenee(as *Botys*) Möschler. Gundlach.

(One unlabeled specimen — det. Schaus.)

**Pyrausta oculatalis** Möschler (as *Botys*) 89-282, TYPE from Porto Rico.(as *Botys*), Gundlach.**Pyrausta illutalis** Guenee(as *Condylorrhiza*) Möschler. Gundlach.**Pyrausta cardinalis** Guenee(as *Botys*) Möschler. Gundlach.

at light at Aibonito (SSC — det. Schaus).

**Pyrausta episcopalis** Herr. Sch.(as *Botys*) Möschler. Gundlach.**Pyrausta phoenicealis** Hübner(as *Botys* and as *Botys insignitalis* Guenee) Möschler. Gundlach.larva on *Hyptis capitata* (323-16 det. Schaus).**Pyrausta tyralis** Guenee(as *Botys diffusa* G. & R.) Möschler. Gundlach.**Pyrausta glorialis** Herr. Sch.(as *Botys*) Möschler. Gundlach.**Pyrausta gracilalis** Herr. Sch.(as *Botys*) Möschler. Gundlach.

**Botys citrinalis** Möschler 89-282, TYPE from Porto Rico.

**Botys albifrontalis** Möschler 89-284.

**Botys villicalis** Möschler (described from Jamaica).

**Botys principaloides** Möschler 89-285.

**Botys intricatalis** Möschler 89-286.

**Botys terricolalis** Möschler (described from Surinam).

**Botys evincalis** Möschler 89-287.

**Botys concinnalis** Möschler 89-287.

**Botys fortificalis** Möschler 89-288.

**Botys secernalis** Möschler 89-288.

**Botys flammeolalis** Möschler 89-289.

Gundlach.

"Not placed" by Mr. Schaus.

**Noctuelia thalialis** Walker

Van Z. (P. R. 1412).

very common at light at Guánica (636-13 det. Schaus).

**Stenoptycha pterophoralis** Walker

(as *Lineodes gracilalis* Herr. Sch.) Möschler. Gundlach.

**Lineodes metagrammalis** Möschler 89-305, TYPE from Porto Rico.

Gundlach.

**Lineodes triangulalis** Möschler 89-305, TYPE from Porto Rico.

Gundlach.

**Cerobasis pachylefidella** Hamp.

Van Z. (1612) or (62) on *Hepatica* (*Herpetica*) *alata*.

#### NYMPHULINÆ.

**Paraponyx infirmalis** Möschler

Möschler. Gundlach.

**Paraponyx rugosalis** Möschler 89-318, TYPE from Porto Rico.

Gundlach.

(One unlabeled specimen — det. Schaus.)

**Paraponyx vestigialis** Snell

Möschler. Gundlach.

**Cataclysta opulentalis** Lederer

Möschler. Gundlach.

**Cataclysta angulatalis** Lederer

Möschler. Gundlach.

- Cataclysta sumptuosalis** Möschler 89-319, TYPE from Porto Rico.  
Gundlach.
- Cataclysta miralis** Möschler 89-319, TYPE from Porto Rico.  
Gundlach.  
(Unlabeled specimens — det. Schaus.)
- Cataclysta minimalis** Herr. Sch.  
Stahl.
- Argyractis plusialis** Herr. Sch.—det. Schaus.  
common at light at Guánica (646-13).
- Piletocera bufalis** Guenee  
(as *Penestola praeficalis* Möschler 89-316, TYPE from Porto Rico Gundlach 91-553, No. 540.
- Somatania pellucidalis** Möschler 89-301, fig. 22, TYPE from Porto Rico.  
Gundlach 91-545, No. 505.  
“= *Stenia samealis* Dyar” Mr. Schaus.

## EPIPASCHIIINAE.

- Tetralopha scabridella** Ragonot  
Möschler. Gundlach.  
Brown larvae with lighter-colored medio-dorsal stripe bordered with black, web together several terminal leaves of *Inga vera*, making “nidos de las mariposas”, at Lares (160-22 det. Schaus), at Cayey (386-22), common on host throughout the coffee districts.
- Pococera atramentalis** Lederer  
(as *Philotricha erigens* Ragonot) Möschler. Gundlach.  
Van Z. (1226) on mango and (1626) on *Clerodendron squamatum*.  
(Unlabeled specimens — det. Schaus.)
- Pococera insularella** Ragonot  
Möschler. Gundlach.
- Jocara ragonoti** Möschler (as **Deuterollyta**) 89-280, TYPE from Porto Rico.  
(as *Deuterollyta*) Gundlach 91-530, No. 431.
- Jocara majuscula** Herr. Sch.  
(as *Deuterollyta infectalis* Möschler 89-279, TYPE from Porto Rico) Gundlach 91-530, No. 430.
- Stericta alnotha** Schaus, Wm., Proc. Ent. Soc. Washington, Vol. 24, No. 9, p. 239, 1922: TYPE from Porto Rico.

## CHRYSAUGINAE.

- Tamyra albomaculalis** Möschler 89-278, TYPE from Porto Rico.  
Gundlach.

**Pachymorphus subductellus** Möschler 89-324, TYPE from Porto Rico.  
Gundlach.

at light (284-22); larvae boring in twigs of roble, *Tecoma pentaphylla* (426-12 det. Schaus):

**Carcha herselialis** Walker

(as *Coeloma tortricalis* Möschler 89-277, TYPE from Porto Rico)  
Gundlach.

**Ethnistis munitalis** Lederer

Möschler. Gundlach.

larvae in seed pods of roble, *Tecoma pentaphylla* (889-16  
det. Schaus, 328-21 det. Dyar).

**Callasopia rosealis** Möschler 89-275, TYPE from Porto Rico.  
Gundlach.

"Probably a synonym of *Caphys bilinea* Walker." Mr.  
Schaus.

**Stretopalpia minusculalis** Möschler (as **Tamyra**) 89-278, TYPE  
from Porto Rico.

(as *Tamyra*) Gundlach.

(Unlabeled specimens det. Schaus as *S. deera* Druce.)

**Ballonicha recurvata** Möschler

Möschler. Gundlach 91-509, No. 341.

#### PYRALINAE.

**Pyalis manihotalis** Guenee

(as *Parasopia dissimilalis* Möschler 89-276, TYPE from Porto  
Rico) Gundlach.

larvae feeding on rice (252-17, 22-16), on corn meal and  
rice (614-17 det. R. T. Cotton).

**Pyalis (Asopia) gerontesalis** Walker

Möschler. Gundlach.

#### SCHOENOBIINAE.

**Scirpophaga albinella** Cramer

(as *S. leucateia* Zeller) Möschler. Gundlach.

(as *Rupella*) Van Z. (P. R. 1410).

common at light at Guánica (600-13 det. Dyar).

**Scirpophaga longicornis** Möschler 89-321, TYPE from Porto Rico.  
Gundlach.

at light (1215-13 det. Schaus).

#### CRAMBINAE.

**Crambus ligonellus** Zeller

Möschler. Gundlach.

(Unlabeled specimens — det. Schaus.)

**Crambus detomatellus** Möschler 89-322, TYPE from Porto Rico.  
Gundlach.

**Crambus discludellus** Möschler 89-323, TYPE from Porto Rico.  
Gundlach.

**Crambus gestatellus** Möschler 89-323, TYPE from Porto Rico.  
Gundlach.

**Crambus fissiradiellus** Walker—det. Schaus  
(Unlabeled specimens.)

**Crambus hastiferellus** Zeller  
(as *C. quinquareatus* Zeller) Möschler. Gundlach.  
resting on sugar cane at Manatí (103-21 det. Dyar).

**Argyra diplomachalis** Dyar—det. Schaus  
on weeds and at light (833-16).

**Argyra lusella** Zeller  
Möschler. Gundlach.

**Argyra nivalis** Drury  
Möschler. Gundlach.

**Diatraea saccharalis** Fabricius

(as *Diatraea obliterattella* Zeller) Möschler. Gundlach.

Busck 00-89: the larvae boring in stalks of sugar cane. "The annual cutting and crushing the cane with all living larvae and pupae naturally keeps the pest in check, but the remaining roots and single canes always contain enough individuals to infest the next year's growth."

May 06-10: recommends that "seed-cane be soaked twenty-four hours before planting to destroy (the larvae).

Tower 07-28: the same recommendation.

Van Dine 11-45: an extended preliminary account.

Van Dine, D. L., "Damage to Sugar Cane Juice by the Moth Stalk-Borer (*Diatraea saccharalis* Fabr.)." Circ. No. 1, Expt. Station P. R. S. P. A., Río Piedras, 1912, pp. 1-11.

Van Dine 12-16: additional notes.

In lists of insect pests of sugar cane by Van Dine 13-251, Van Dine 13-28 and Smyth 19-144.

Van Z. (303) on sugar cane, corn, guinea grass and gramma grass.

Jones, Thos. H., "The Sugar-Cane Moth Stalk-Borer (*Diatraea saccharalis* Fabr.)." Bull. 12, Expt. Station, Bd. Comm. Agr., P. R., Río Piedras, March 16, 1915, pp. 1-30, figs. 8: an extended account, description of stages, life-history and parasites.

Johnston 15-24: as host of *Cordyceps barberi*.

Wolcott, G. N., "Influence of Rainfall and Burning the Trash



- on the Abundance of *Diatraea saccharalis*" Circ. 7, Insular Experiment Station, Río Piedras, 1915, pp. 1-6, map.
- Wolcott 17-80: a continuation of the observations reported in Circ. No. 7, with map.
- Stevenson 18-218: as host of *Isaria (Cordyceps) barberi* Giard.
- Cotton 18-290: a pest of corn. Illustration of pupa and adult.
- Colon 19-40: a summary of the work on *Diatraea* at the Insular Station to date.
- Wolcott 21-36: notes.
- Wolcott, G. N., "The Influence of the Variety of Sugar Cane on Its Infestation by *Diatraea saccharalis* Fabr., and the Other Factors Affecting the Abundance of the Moth Borer." Jour. Dept. Agr. P. R., Vol. 6, No. 1, Jan. (October) 1922, pp. 21-31: illustrations of *Trichogramma minutum* Riley and *Prophanurus alecto* Crawford, the parasites of the eggs in Porto Rico.
- Wolcott 23-55: unsuccessful use of larvae as vectors in transmission of gumming disease of sugar cane.
- at light (154-13, 452-13), at Arecibo (148-13), at Guánica (551-13 det. Dyar), at Luquillo (199-13); emerged through 1½ inches of soil (967-13); larvae on sugar cane (165-11, 9-12 det. Dyar, 327-12, 264-13, 356-13, 421-13, 939-13, 96A-18, 69-19, 109-21), at Arecibo (184-11), at Santa Isabel (130-13), at Aguirre (26-11, 28-11), at Luquillo (276-13), killed by *Cordyceps (Isaria)* fungus at Guánica (45-10, 33-11), at Santa Isabel (184-12); larvae on corn (53-12 det. Dyar, 610-17, 617-17, 631-17), at Caguas (325-21); larvae on elephant grass at Humacao (682-18), on *Hymenachne amplexicaule* (934-13), on malojillo, *Panicum barbinode* (882-13, 909-13 det. Dyar), on grass and cane at Guánica (231-11, 171-13), at Patillas (175-12); eggs on rice at Comerío (940-13 — adults, reared on sugar cane, det. Dyar).

**Chalcoela discederalis** Möschler 89-320, TYPE from Porto Rico. Gundlach.  
(unlabeled adult — det. Schaus.)

## GALLERIINAE.

**Galleria mellonella** Linnaeus  
Möschler. Gundlach. Van Z. (1720).

**Corcyra cephalonica** Stainton  
Chittenden, F. H., "The Rice Moth" Bull. 783, U. S. Dept. Agr., July 14, 1919, pp. 1-15: Porto Rican records of eggs laid in sacks of cereals, larvae abundant in rice and reared from chocolate.  
larvae attacking dry garbanzos or chick peas (543-22 det. R. T. Cotton).

## PHYCITINAE.

**Myelois furvidorsella** Ragonot  
Möschler. Gundlach.

**Crocidomera turbidella** Zeller  
Möschler. Gundlach.  
(Unlabeled specimens — det. Schaus.)

**Crocidomera fissuralis** Walker  
Möschler. Gundlach.

**Fundella pellucens** Zeller  
Möschler. Gundlach.

**Fundella cistipennis** Dyar  
(as *Pachyzancla bipunctalis* Fab.) Jones 15-8: attacking garden beans and sword beans, *Canavalia ensiformis*. Notes.  
(as *Ballovia*) Cotton 18-292: the stalk and pod borer of cowpeas. Notes and illustration of adult.  
larvae boring in stalks and stems of cowpeas (66-12 det. Dyar, 709-17), of sword beans (219-12, 875-14, 879-14, 880-14), of *Cassia occidentalis* (881-14).

**Piesmopoda rubicundella** Zeller  
Möschler. Gundlach.

**Piesmopoda rufulella** Ragonot  
Möschler. Gundlach.

**Piesmopoda columella** Zeller  
Möschler. Gundlach.

**Cuba furculella** Dyar  
(Unlabeled specimens — det. Schaus.)

**Salebria famula** Zeller  
Möschler. Gundlach.

**Elasmopalpus lignosellus** Zeller  
Möschler. Gundlach.

**Elasmopalpus rubedinellus** Zeller  
Möschler. Gundlach.  
abundant flying over land just plowed at Maunabo (541-12 det. Schaus).

**Oligochroa pellucidella** Ragonot  
Möschler. Gundlach.

**Laetilia portoricensis** Dyar, H. G., TYPE from Porto Rico.  
larvae feeding on scale insects, *Lecanium* sp., on *Cajanus indicus* at Mameyes (995-13 det. Dyar, TYPE); larvae on withered stems of *Eupatorium odoratum* (896-16 det. Schaus).

**Oncolabis anticella** Zeller  
Möschler. Gundlach.

**Homoesoma maturella** Zeller  
Möschler. Gundlach.

**Homoesoma exiguella** Ragonot  
Möschler. Gundlach.

**Plodia interpunctella** Hübner  
larvae in dry dates (108-21 det. J. D. More).

**Etiella zinckenella** Treitschke  
Möschler. Gundlach.

**Pempelia diffisella** Zeller  
Möschler. Gundlach.

COSSIIDAE.

**Psychonoctua** sp. nov.—det. Schaus  
Hooker 13-35: "a lepidopterous borer, determined by Dr. H. G. Dyar as *Psychonoctua* sp., which was reported by Tower (08-27) as boring in orange, citron, rose-apple and sweet almond, has done considerable damage, where the trunks and larger branches of the coffee plants are riddled with canals."  
Van Zwaluwenburg 17-516: tentatively determined by Dr. Dyar as *P. jamaicensis* Schs., "most often found in old coffee at altitudes up to 1,500 ft., pruning and burning invaded wood" as control.  
in coffee grove in mountains north of Yauco (245-22); larvae in coffee at Villalba (359-21), at Lares (55-22).

PTEROPHORIDÆ.

**Pterophorus basalis** Möschler (as **Oedematophorina**) 89-345, TYPE from Porto Rico.  
Gundlach.

**Pterophorus paleaceus** Zeller  
Möschler. Gundlach.

**Pterophorus** sp.—det. Busck.  
larva on *Ipomoea rubra* (892-16),

**Adaina bipunctata** Möschler (as **Pterophorus**) 89-346, TYPE from Porto Rico.  
Gundlach.

**Adaina participata** Möschler (as **Pterophorus**) 89-346, TYPE from Porto Rico.  
Gundlach.

**Adaina praeusta** Möschler (as **Pterophorus**) 89-346, TYPE from Porto Rico.  
Gundlach.

**Platyptilia pusillidactyla** Walker (or near this species)

larvae on *Caperonia palustris* (390-16, 313-16), on *Caperonia regalis* (as *Oxyptilus* sp.—det. Busck, 577-12).

#### ALUCITIDÆ.

**Alucita eudactyla** Felder & Regenhofer

Möschler. Gundlach.

#### OLETHREUTIDÆ.

**Olethreutes** sp. (near *malachitana* Zeller)—det. Dyar.

larvae light olive green, head light brown, webs together  
leaflets of *Phyllanthus lathyroides* (978-13, 288-16, 393-16).

**Phoxopteria virididersana** Möschler 89-334, TYPE from Porto Rico.  
Gundlach.

**Grapholitha excitana** Möschler 89-333, TYPE from Porto Rico.  
Gundlach.

**Grapholitha longipalpana** Möschler 89-333, TYPE from Porto Rico.  
Gundlach.

#### TORTRICIDÆ.

**Archips** sp.—det. Smyth

larvae on *Spondias lutea* (880-16), on *Malachra rotundifolia* (901-16).

**Tortrix affaetana** Möschler 89-330, TYPE from Porto Rico.  
Gundlach.

**Tortrix insignitana** Möschler 89-330, TYPE from Porto Rico.  
Gundlach.

**Apinoglossa comburana** Möschler 89-331, TYPE from Porto Rico.  
Gundlach.

#### PHALONIIDÆ.

**Phalonia** sp.—det. Busck

larvae boring in flower heads of *Erecthites hieracifolia*  
(332-16).

**Cochylis prolectana** Möschler 89-332, TYPE from Porto Rico.  
Gundlach.

**Cochylis tectonicana** Möschler 89-332, TYPE from Porto Rico.  
Gundlach.

**Cochylis vicinitana** Möschler 89-332, TYPE from Porto Rico.  
Gundlach.

**Commophila** sp.—det. Busck

larvae boring in buds of *Dahlia*, causing them to wither  
(210-22).

## EUCOSMIDÆ.

**Strepsicrates smithiana** Walker  
reared from *Psidium guajava* (870-16).

## GELECHIDÆ.

**Sitotroga cerealella** Oliver—det. Cotton  
larvae in corn (615-17), at Vega Baja (440-21).

**Phthorimaea operculella** Zeller  
(as *Gelechia pipipella*) Barrett 05-396: "slight damage to tobacco at Aguas Buenas."  
Cotton 18-299: attacking eggplant. Notes and control.  
Wolcott 21-49: attacking tobacco.  
Wolcott 22c-11: as "candela o candelilla", a pest of tobacco. Notes and control. Colored illustration of injury.  
Wolcott 23-47: rainfall an important factor in control.  
larvae mining in leaves of eggplant (544-17, 567-17, 581-17, 591-17); in leaves of tobacco at Rincón (15-21), at Manatí, Arecibo, San Germán and Yauco (GNW).

**Dichomeris manellus** Möschler (as *Ipsolophus*) 89-344. TYPE from Porto Rico.  
(as *Ipsolophus*) Gundlach.

**Dichomeris zingarella** Walsingham  
reared by Mr. Busek from *Coccoloba*, San Juan, February, 1899.

**Trichotaphe** sp. nov.—det. Busek  
a small grey moth with thick orange antennae, a large black spot near base of forewings, larva a leafroller on *Inga vera* (75-23).

**Gelechia exclaratella** Möschler 89-343, TYPE from Porto Rico.  
Gundlach.  
= *exclarella* Wen.

**Gelechia costipunctella** Möschler 89-344, TYPE from Porto Rico.  
Gundlach.  
= *G. bosquella* Chambers.

**Gelechia rivulella** Möschler 89-344, TYPE from Porto Rico.  
Gundlach.

**Pectinophora gossypiella** Saunders—det. More, confirmed Heinrich.  
Wolcott, More & Seín, "La Oruga Rosada de la Cápsula del Algodón en Puerto Rico" Circ. 63, Insular Experiment Station, Río Piedras. October, 1921, pp. 1-12, fig. 4. First record in Porto Rico, life history and control.  
Wolcott, G. N., "The Distribution of the Pink Bollworm of Cotton, *Pectinophora gossypiella* Saunders, in Porto Rico." Jour.

Ec. Ent., Vol. 15, No. 4, August, 1922, pp. 313-314. Map, showing distribution in the spring of 1922.

Wolcott, G. N., "The Distribution of the Pink Bollworm in Porto Rico," Circ. No. 85, Insular Experiment Station, Río Piedras, P. R., pp. 3-7, map. September, 1923.

larvae in cotton bolls at Humacao (509-Aug. 13, 1921, 263-Aug. 23, 1921, 510-21, 527-22, 591-22), at Yabucoa (512-22, 513-22), at Maunabo (514-22, 529-22, 530-22), at Patillas (510-22, 536-22), at Guayama (511-22, 537-22), at Aguirre (508-21), at Salinas (531-22, 532-22, 534-22), at Fortuna (377-21), at Peñuelas (378-21), at Guayanilla (378-21), at Guánica (275-Sept. 1921, 501-22, 501A-22, 558-22), at Sabana Grande (502-22, 503-22, 561-22, 563-22, 564-22, 565-22, 566-22), at Cabo Rojo (500-22, 506-22), at Añasco (555-22 injured boll—not larva), at Córseica (567-Aug. 1922), at Coloso (556-22, injured boll—not larva), at Moca (507-22), at Bayaney, 15 km. south of Arecibo (553-22), 12 km. south of Arecibo (554-22), at Arecibo (268-Sept. 1921, 270-21, 341-21), at Camuy (269-Sept. 1921, 273-21, 504-21), at Hatillo (271-21, 272-21, 501-21, 502-21, 505-21, 506-21, 507-21, 571-22, 572-22, 576-22), at Isabela (274-21), at Garrochales (573-22), at Barceloneta (577-22), at Vega Baja (514-21, 518-22, 522-22, 525-22, 646-22, 569-22, 574-22), at Dorado (540-22, 562-22), at Pt. Cangrejos (539-22, 500-23), at Loíza (559-22), at Río Grande (588-December, 1922, 589-22), at Mameyes (519-22, 535-22), at Luquillo (590-22, 593-22), at Fajardo (513-21, 518-22, 538-22), at Naguabo (276-21, 526-22), at Las Piedras (511-21), at Juncos (592-December, 1922): larva in okra at Humacao (512-21).

## ETHMIIDÆ.

**Ethmia abraxella** Walker

Van Z. (P. R. 1403).

adults at light at Guánica (599-13) — det. Busck.

**Ethmia adustella** Zeller

Van Z. (P. R. 1402).

(as *Psecadia*) Möschler. Gundlach.

adults at light at Guánica (596-13) — det. Busck.

**Ethmia confusella** Walker

Van Z. (P. R. 1404).

adults at light at Guánica (622-13) — det. Busck.

**Ethmia xanthorrhoea** Zeller

Van Z. (P. R. 1405).

(as *Psecadia*) Möschler. Gundlach.

adults at light at Guánica (604-13) — det. Busck.

**Ethmia notatella** Walker

Busck.



*Ethmia aureoapicella* Möschler (as *Psecadia*) 89-341, TYPE from Porto Rico.  
(as *Psecadia*) Gundlach.

*Ethmia ingricella* Möschler (as *Psecadia*) 89-343, fig. 19, TYPE from Porto Rico.  
(as *Psecadia*) Gundlach.  
= *Ethmia confusella* Walsingham.

*Ethmia kirbyi* Möschler (as *Psecadia*) 89-342, TYPE from Porto Rico.  
(as *Psecadia*) Gundlach.

· COLEOPHORIDÆ.

*Coleophora* sp.—det. Busck  
Wolecott 21-37: the "Sugar Cane Case-Bearer", at Toa Baja.  
Notes.

COSMOPTERYGIDÆ.

*Cosmopteryx gemmiferella* Clemens  
Möschler. Gundlach.

*Cosmopteryx attenuatella* Walker  
Busck.

*Batrachedra albistrigella* Möschler 89-345, TYPE from Porto Rico.  
Gundlach.

*Pyroderces rileyi* Walsingham—det. More  
larvae in old cotton bolls at Arecibo (340-21, 552-21), at Vega Baja (360-21), at Villalba (554-21), at Maunabo (530-22).

*Homaledra sabulella* Chambers, A. B.  
larvae common on leaves of coconut palm (320-19, 69-23 det. Busck), at Arecibo (283-19); on leaves of *Livistona* palm (GNW), eating the lower side of the leaf and webbing together their excrement for a shelter, at times so common as to cause the leaves to turn brown. On coconut palms at Pt. Cangrejos, Manatí, Mayagüez, Naguabo and on Vieques Island (GNW).

YPONMEUTIDÆ.

*Trichostibas sordidata* Zeller  
Busck.

*Yponomeuta triangularis* Möschler 89-339, TYPE from Porto Rico.  
Gundlach.

larvae making nests between leaves of *Elaeodendron xylocarpum* at Boquerón (112-23 det. Busck), at Pt. Salinas (GNW).

**Euarne obligatella** Möschler 89-340, TYPE from Porto Rico. Gundlach.

(**Mieza abulata** Herrich Schaeffer  
Dewitz 77-95.)

**Plutella maculipennis** Curtis

(as *Plutella xylostella* Linnaeus) Möschler. Gundlach.

Barrett 04-448: on cabbage.

Tower 08-35: on cabbage, kale, mustard and turnips. Notes and control.

Jones 15-9: notes and illustration of injured mustard leaf.

Cotton 18-281: notes and illustrations of all stages. "the worst insect pest of cabbages in Porto Rico."

at light (343-16); larvae on cabbage (193-12, 194-12, 420-16), at Arecibo (159-19).

**Brenthia pavonacella** Clemens

Möschler. Gundlach.

adults abundant in coffee grove (431-21 det. Heinrich — "feeds on *Amphicarpaea*"), at Yauco, Adjuntas and Utuado (255-22); resting on morning glory (887-16).

**Tortyra auriferalis** Walker (?)

Busck.

**Choregia aurofasciana** Snellen

Möschler. , Gundlach.

#### GRACILARIIDÆ.

**Acrocercops sanctaecrucis** Walsingham—det. Busck

Cotton 18-300: mining in eggplant leaves. Notes.

larvae mining in leaves of eggplant and *Solanum torvum* (108-16, 525-17, 580-17).

#### TINEIDÆ.

**Ereuntis minuscula** Walsingham—det. Busck

larvae under scale insects, *Diaspis pentagona*, on papaya (816-12); feeding on scale insects, *Lepidosaphes beckii*, on grapefruit tree (16-17); a scavenger on old cotton bolls at Humacao (551-21 det. Heinrich), at Fortuna (556-21), at Mameyes (521-22); in dry okra pod at Vega Baja (559-21), in partitions of pods of *Thespesia populnea* at Guayanilla (557-21).

**Leucoptera coffeella** Stainton

Barrett 04-444; van Leenhoff 04-454; Earle 04- : the coffee leafminer. Notes.

Barrett 05-397: parasitized by *Chrysocharis livida* Ashmead.

Barrett 06-22: parasitized by *Zagrammosoma multilineata* Ash-

mead. *Chrysocharis livida* present throughout the coffee-growing sections.

Van Leenhoff 06-46: severe outbreaks cause shedding of leaves.

Van Zwaluwenburg 15-32: a rather extend account, life-history and unsuccessful control measures.

Van Zwaluwenburg 17-514: Van Z. (602) on coffee.

Wolcott, G. N., "El Minador de las Hojas del Café", Circular No. 52, Insular Experiment Station, Río Piedras, P. R., October, 1921, pp. 1-12, figs. 6.

Wolcott, G. N., "A Reaction to a Variation in Light Intensity by *Leucoptera coffeella*". Ecology, Vol. 3, No. 1, January, 1922, p. 86.

larvae in coffee leaves at Jajome Alto (30-21), at Lares (631-21), common throughout the island wherever the host occurs, an especially serious pest south of Adjuntas.

**Amydria** sp. near or = **umbraticella** Busck

larvae in rotten underground stem of sugar cane (61-15 det. Busck).

**Setomorpha insectella** Fabricius—det. Busck

larvae in bottle of paprika (589-12).

**Tineola uterella** Walsingham—det. Busck

larvae living in flattened cases on walls of houses (162-12).

**Opogona** sp.—det. Busck

Wolcott 21-37: the Porto Rican Sugar Cane Bud Moth. 1.2% of cane stalks injured by larvae eating eyes. Notes. (Mr. Busck notes: "Probably scavenger, secondary to the injury.") (642-21), adults on sugar cane (375-16), at Arecibo (656-17) common; larvae attacking eyes of cane at Canóvanas (784-12).

**Opogona** sp.—det. Busck

larvae scavengers in old leaves of coconut palm previously infested with *Homaledra sabulella* Chambers (596-22).

**Pexicnemidia mirella** Möschler 89-338, TYPE from Porto Rico. Gundlach.

**Tiquadra aspera** Zeller

Möschler. Gundlach.

**Tiquadra inscitella** Walker—det. Busck

pupa in rotten *Erythrina* tree at Cayey (420-22).

**Myrmecozela ochraceella** Tengstr.

Möschler. Gundlach.

#### ACROLOPHIDÆ.

**Acrolophus vitellus** Poey

Busck.

**Acrolophus plumifrontellus** Clemens

Möschler. Gundlach.

(as sp. — det. Busck) at Guánica (369-14), at light at Guánica (621-13).

**Acrolophus walsinghamsi** Möschler 89-336, TYPE from Porto Rico. Gundlach.**Acrolophus ochracea** Möschler (as **Caenogenes**) 89-337, TYPE from Porto Rico. Gundlach.**Acrolophus popeanella** Clemens(as *Anaphora*) Möschler. Gundlach.(as *Anaphora* sp. det. Smyth) rare at light (973-16), at Guánica (619-13); larvae dirty brown, spin silken tunnels among trash on ground at Guánica (368-14, 370-14, 520-14, 521-14).



## DIPTERA.

### LITERATURE.

- Roeder, Victor von,** "Dipteren von der Insel Porto Rico," etc. Stettiner Entomo. Zeitschrift, 1885, pp. 337-349.
- Coquillett, D. W.,** "Report on a Collection of Dipterous Insects from Porto Rico." Proc. U. S. Nat. Museum, Vol. 22, pp. 249-270. 1900, Washington, D. C.
- Aldrich, J. M.,** "A Catalogue of North American Diptera." Smithsonian Misc. Collections, Part of Vol. 46, No. 1444, pp. 1-680, 1905, Washington, D. C.
- Tower, W. V.,**  
12-1 to 23. "A Study of Mosquitoes in San Juan, Porto Rico." Circ. 14, P. R. Agr. Expt. Sta., pp. 1-23, June, 1911. Mayagüez, P. R., 1912.
- Tower, W. V.,**  
21-1 to 10. "Mosquito Survey of Mayagüez." Circ. 20, P. R. Agr. Expt. Sta., pp. 1-10. Nov. 2, 1921, Washington, D. C.

The papers of Von Roeder and Coquillett were not available for the preparation of this list, but all their records are given by Aldrich, and when listed here, imply that in addition, they occur in Aldrich's paper. Dr. Aldrich has named practically all the Diptera collected by the workers at the Insular Station, and unless otherwise specified, determination by him is always implied. The writer is also greatly indebted to him for reviewing and suggesting numerous changes and corrections in the first copy of this list. — Prof. C. L. Metcalf has determined some of the Syrphidae, Mr. W. R. Walton described several of the Tachinidae, Mr. J. R. Malloch has described and determined a considerable number of flies in other families, and Mr. C. T. Greene has made some determinations.

### TIPULIDÆ.

- Monogoma niveitarsus** Alexander, Chas. P., "A Synopsis of Part of the Neo-Tropical Crane-Flies of the Sub-family Limnobiinae." Proc. U. S. Nat. Mus. Vol. 44, No. 1966, p. 501, TYPE from Porto Rico. April 30, 1913, Washington, D. C.



**Geranomyia rufescens** Loew, Hermann, "Beschreibungen einiger neuen *Tipularia terricola*" *In* Linn. Ent., Vol. 5, p. 396, pl. 2, fig. 9-12. 1851. TYPE from Porto Rico.

Roeder. Gundlach, "El ejemplar típico era de Puerto Rico. Hasta ahora no se ha encontrado en otras islas."

**Toxorhina fragilis** Loew 51-401, TYPE from Porto Rico.

Roeder. Gundlach, "El tipo era también de Puerto Rico, donde solamente ha sido observado la especie."

**Rhamphidia albitarsis** Osten Sacken, C. R., "Studies on Tipulidae, Part II." *In* Berlin Ent. Zeitschrift, Vol. 31, p. 184, 1887, TYPE from Porto Rico.

**Atarba (Gonomyia) pleuralis** Williston  
Coquillett. Alexander 13-504.

**Eriocera trifasciata** Roeder 85-338, TYPE from Porto Rico.  
Gundlach, "rara."

**Megistocera longipennis** Macquart

Roeder. Gundlach, "no es rara."

Alexander, Chas. P., Jour. N. Y. Ent. Soc., Vol. 22, No. 3, Sept. 1914.

**Megistomastix portoricensis** Alexander, Chas., "A Peculiar New Crane-fly from Porto Rico." *In* Psyche, Vol. 19, pp. 63-66, pl. 1, 1912: TYPE from El Yunque, Porto Rico, 2,800 ft. Feb. 20, 1900, Coll. C. W. Richmond.

**Brachypremna unicolor** Osten Sacken 87-329, TYPE from Porto Rico.

#### PSYCHODIDÆ.

**Psychoda phalaenoides** Linn.  
Stahl.

**Psychoda albipuncta** Williston—det. Aldrich  
larvae in dirty water (193-22).

#### CHIRONOMIDÆ.

**Culicoides phlebotomus** Williston—det. (?) Aldrich. "jejen."  
on the beach at Mameyes, biting man (338-22); at Pt. Can-  
grejos—det. (?) Johannsen, (GNW).

**Ceratopogon punctipennis** Williston  
Coquillett.

**Ceratopogon sequax** Williston  
Coquillett.

**Forcipomyia eriophora** Williston—det. Aldrich

sucking juices from larva of *Phlegethontius sexta* Joh. (183-22) and probably this species (84-16, 844-16).

**Chironomus redeuns** Walker

Coquillett.

**Chironomus anonymus** Williston

Tower 12-6: at Mayagüez, from water in old pail.

## CULICIDÆ.

**Anopheles albimanus** Wiedemann

Roeder. Gundlach.

Tower 21-6: "the malarial mosquito — in rain-water barrels."

**Anopheles grabhami** Theobald

Tower 21-6: "legs — very long. The last ankle segment is white and there is a black band next to the claw."

**Anopheles punctipennis** Say

(as *Corethra*) Roeder. Gundlach.

**Megarhinus portoricensis** Roeder 85-337, TYPE from Porto Rico.  
Gundlach.**Culex bisulcatus** Coquillett

Tower 08-38: mention.

Tower 12-6: at Mayagüez, from water in old pail.

**Culex pipiens** Linn.

Stahl, "zancudo."

Tower 08-38: mention.

**Culex quinquefasciatus** Say

(as *Culex cubensis* Bigot) Tower 08-38: mention.

Tower 12-6: "the common house mosquito of the tropic".

Van Z. (1729).

Tower 21-5: a short description and notes on habits.

**Culex salinarius** Coquillett

Tower 08-38: mention.

**Culex similis** Theobald

Tower 12-6: mention.

**Culex toweri** Dyar & Knab (TYPE probably from Porto Rico).

Tower 08-38: mention.

Tower 12-6: at Mayagüez, in bamboo pots.

**Taeniorhynchus perturbans** Walker

Howard, L. O., Bul. 25 (n. s.) Bur. Ent., U. S. Dept. Agr., 1910.

**Aedes (Stegomyia) aegypti** Linn.(as *Culex fasciatus* Fabr.) Gundlach.(as *A. (S.) calopus* Meigen) Van Z. (1728).

Tower 12-6: at Mayagüez, in water tank.

(as *Stegomyia calopus*) Tower 08-38: mention.Dyar, H. C., *Insecutor Inscitiae Menstruus*, Vol. 8, No. 10-12, p. 181, 1920.

Tower 21-5: "The Yellow-Fever Mosquito". Notes.

**Aedes (Stegomyia) mediovittata** Coquillett

Tower 08-38: mention.

Tower 12-6: at Mayagüez, in hollow tree trunks, tin cans and bamboo pots.

**Aedes (Taeniorhynchus) portoricensis** Ludlow, *Can. Ent.*, Vol. 39, p. 386, 1905. TYPE from Porto Rico.

## MYCETOPHILIDÆ.

**Mycetophila** sp. nov.—det. Knab.dung-bearing larvae in *Inga laurina* at Aibonito (627-17).**Sciara** sp.—det. Knab

larvae in cottony substance secreted by mealybugs on sugar cane (16-12).

**Sciara** sp.—det. Greene

adults on corn leaves at Aguadilla (29-22, 228-22).

## CECIDOMYIDÆ.

**Arthrocnodax constricta** Felt, E. P., *Jour. Ec. Ent.*, Vol. 9, No. 6, p. 481, December 1914: "from garden beans infested with the common red spider, *Tetranychus bimaculatus*, and probably predaceous thereupon." (479-13 TYPE.)**Karschomyia cocci** Felt, E. P., *Can Ent.*, Vol. 45, No. 9, pp. 304-305, 1913: from *Pseudococcus sacchari* Ckll. on sugar cane at Patillas (242-13 TYPE).

Jones 14-461: mention.

Smyth 20-124: probably this species from *Pseudococcus virgatus* Ckll. on cotton. "The adults display the strange habit of hanging in rows festooned on strands of spider-web, where they perform a rocking motion by means of the wings."reared from *Pseudococcus sacchari* Ckll. (556-16).**Mycodiplosis insularis** Felt 13-305: from red spiders, *Caligonus antillarum* sp. nov. Banks, on leaves of *Leonotis neptaeifolia* (582-12 TYPE).reared from same host on leaves of *Asclepias curassavica* (695-12).

**Cecidomyia coccidarum** Cockerell

Coquillett: "from larvae associated with *Dactylopius (Pseudococcus) citri*—from *Lecanium (Saissetia) hemisphaerica*."

**Cecidomyia coccolobae** Cook—det. Stevenson

from small cone-shaped galls on leaves of *Coccolobis pyrifolia* (728-17) and *Coccolobis uvifera* (729-17).

**Ctenodactylomyia watsoni** Felt

from galls of sea-grape, *Coccolobis uvifera*, in letter of Feb. 9, 1917, by R. H. Van Zwaluwenburg.

**Eriophyes calophylli** Cook—det. Stephenson

causes a transverse narrow pit-like depression in the leaf surface of *Calophyllum calaba* (730-17) at Espinosa.

**Eriophyes cordiae** Cook—det. Stevenson

causes irregular fuzzy growths on underside of leaves of *Cordia collococca* (733-17) at Yauco.

**Eriophyes guazumae** Cook—det. J. A. Stevenson

causes small irregular nodule-like growths on underside of leaves of *Guazuma ulmifolia* (731-17) at Naguabo.

**Eriophyes miconiae** Cook—det. J. A. Stevenson

causes large irregular fuzzy growths on undersides of leaves of *Miconia* (732-17).

## BIBIONIDÆ.

**Scatopse pygmaea** Loew

Coquillett.

(as sp.) Wetmore 16-71, eaten by hummingbird, *Chlorostilbon mangoci*.

**Dilophus** sp.

Wetmore 16-73, eaten by hummingbird, *Anthracothonax viridis*.

## SIMULIIDÆ.

**Simulium haematoptum** Malloch—det. Malloch

low hills (69-12, 503-17).

**Simulium minusculum** Lutz—det. Aldrich

abundant in the spring (212-22).

**Simulium quadrivittatum** Loew

Wetmore 16-66, eaten by P. R. Tody, *Todus mexicanus*.

clearing in the woods (214-13 det. Malloch), near coffee grove (GNW det. Johannsen).

## STRATIOMYIDÆ.

**Hermetia albitarsis** Fabr.

(as *H. sexmaculata*) Macquart, J., Hist. Nat. Dipt., Paris, 1834, Vol. 1, p. 229.

**Hermetia illucens** Linn.

Stahl. Roeder. Gundlach, "se posa muchas veces sobre los troncos de los árboles recién cortados." Coquillett.

Van Z. (P. R. 108).

(258-12, 267-12, 471-12, 316-12, 767-12, 77-13, 747-14, 377-16, 562-17); at Guánica (639-13, 427-14); larvae breeding in "cachaza" filter-press cake (594-17).

**Sargus bicolor** Wiedemann, C. R. W., Aussereuropäische Zweiflügelige Insekten, Vol. 2, p. 41, 1830.

**Macrosargus lateralis** Macquart—det. Greene  
in grapefruit grove (554-17).

**Macrosargus** sp.—det. Greene  
(622-12, 850-16, 553-17); at Aibonito (SSC).

**Neorondania chalybea** Wiedemann—det. Knab  
Van Z. (P. R. 1244) from *Spondias lutea*.  
larvae beneath stinking, flaking bark of dying papaya, *Carica papaya*, tree (843-12); from banana stem (770-16);

**Odontomyia dorsalis** Fabr.  
Coquillett.

TABANIDÆ.

**Chrysops costatus** Fabr.  
Stahl. Roeder. Gundlach "muy común en terrenos bajos, donde suele posarse encima de las orejas de los caballos para chupar la sangre por lo cual es insecto muy molesto."  
Van Z. (P. R. 100).  
at Pueblo Viejo (161-15, 175-15, 184-15), Añasco (1028-13).

**Tabanus psamophilus** O. S.—det. Greene  
on the beach, resting on dry seaweed, as which it is the same color, and in which its larvae live, feeding on sand fleas, at Pt. Cangrejos (114-15), at Vega Baja (493-16).

LEPTIDÆ.

**Chrysopila** sp.—det. Greene  
on the beach at Pt. Cangrejos (GNW).

BOMBYLIDÆ.

**Hyperalonia cerberus** Fabr.  
(as *Exoprosopa*) Stahl. Roeder.  
Gundlach "muy común en terrenos desmontados" (brushy land).  
on the beach at Santurce (602-17) and at Pt. Cangrejos;  
on brushy hill north of Ponce (113-13).

**Hyperalonia servillei** Macquart  
Coquillett.

**Heterostylum ferrugineus** Fabr.—det. Knab  
(592-12, 627-12).

**Exoprosopa cubana** Loew  
Roeder. Gundlach, "rara."

**Anthrax adusta** Loew—det. Greene  
at Guánica (424-13)

**Anthrax bigradata** Loew  
Roeder. Gundlach.

**Anthrax faunus** Fabr.  
Roeder. Gundlach.

**Anthrax gorgon** Fabr.  
Roeder. Gundlach. Coquillett.  
from cocoons of *Elis haemorrhoidalis* Fabr. at Plantaje, Pt.  
Salinas (64-22, 64A-22 det. Greene).

**Anthrax lucifer** Fabr.  
Stahl. Roeder. Gundlach, "común — suele posarse en el suelo".  
Van Z. (P. R. 78).  
at Guánica (423-13 det. Greene).

**Anthrax oedipus** Fabr.  
Gundlach.

**Anthrax paradoxa** Jaennicke  
Osten Sacken, Biologia Centrali-Americana, Dipt. Vol. 1, p. 120,  
1886.  
Roeder. Gundlach.

## THEREVIDÆ.

**Psilocephala argentata** Bellardi  
Roeder.

**Thereva argentata** Bellardi  
Roeder. Gundlach, "rara."

## ASILIDÆ.

**Leptogaster cubensis** Bigot  
Roeder. Gundlach, "rara."

**Atomosia incisuralis** Macquart  
Van Z. (P. R. 1206).  
unlabeled specimens, probably from Guánica.

**Ommatius marginellus** Fabricius, Spec. Ins., II, 464; Ent. Syst.,  
384 (*Asilus*); Syst. Antl., 170 (*Dasypogon*).  
Gundlach. Van Z. (P. R. 107).

**Proctacanthus lutescens** Loew  
Stahl.



**Proctacanthus rufiventris** Macquart

Roeder. Coquillett. Gundlach.

Wolcott 22d-16: "quite common."

common (561-17, 79-10, 17-14) carrying a large grass-hopper at Isabela (GNW) and at Pt. Cangrejos (GNW).

**Erax bastardi** Macquart

Roeder. (as *Erax femoratus* Macq.) Gundlach.

**Erax rufitibia** Macquart

Roeder. Gundlach. Van Z. (det. Knab).

DOLICHOPODIDÆ.

**Psilopus caudatus** Wiedemann—det. Aldrich

**Psilopus ciliipes** Aldrich—det. Aldrich

(37-17), in grape-fruit grove at Vega Alta (107-17).

**Psilopus chrysoprasius** Walker

Roeder. Gundlach.

**Psilopus diffusus** Wiedemann

Roeder. Gundlach.

**Psilopus mundus** Wiedemann

(as *Psilopus ciliatus* Loew, det. Aldrich) at Corozal

**Psilopus jucundus** Loew

Roeder.

**Psilopus longicornis** Fabr.

Coquillett.

**Psilopus pilosus** Loew

Roeder. Gundlach.

**Psilopus portoricensis** Macquart, Hist. Nat. Dipt., I, 450; Dipt.

Exot. II, 2, 121; Suppl., 1, 120, pl. XI, f. 17.

**Psilopus suavius** Walker

Roeder. Gundlach.

**Psilopus dimidiatus** Loew

Roeder. Gundlach.

**Psilopus psittacinus** Loew

Roeder. Gundlach.

**Mesorhaga albiciliata** Aldrich—det. Aldrich

at Guánica (458-14).

**Chrysotus barbatus** Loew

(as *Syntormon*) Coquillett.

**Chrysotus pallipes** Loew

Roeder. Gundlach. Coquillett.

**Paraclius filifer** Aldrich

Coquillett, from Vieques Id.

**Pelastoneurus fasciatus** Roeder 85-340, TYPE from Porto Rico.

Gundlach, "observado solamente en Puerto Rico".

## EMPIDIDÆ.

**Drapetis flavida** Williston

Coquillett.

**Hybos subjectus** Walker = **H. triplex** Walker

Coquillett.

## PHORIDÆ.

**Aphiochaeta aurea** Aldrich

Coquillett.

**Aphiochaeta macrochaeta** Malloch

Van Z.

**Aphiochaeta picta** Lehmann—det. Aldrichfrom dead *Belostoma* adults (1049-16).**Aphiochaeta subflava** Malloch

Van Z.

**Aphiochaeta scalaris** Loew—det. Malloch

from dead May-beetle at Fajardo (526-12), from dead termites (163-21 det. Greene); from dead insects (1049-16, 1050-16).

**Conicera aldrichii** BruesWetmore 16-74, eaten by hummingbird, *Anthrocothorax aurentus*.**Dohrniphora venusta** Coquillett—det. Greenefrom dead termites, *Nasutitermes morio* Latr., (126-21); from decaying bean pods (590-17—det. Malloch); from dead insects (1051-16).**Puliciphora borinquensis** Wheeler, Wm. M., "A New Wingless Fly from Porto Rico," Bull. 12, Amer. Mus. Nat. Hist., Article 14, pp. 267-271, pl. 34, 1906.

## SYRPHIDÆ.

**Baccha capitata** LoewRoeder. Gundlach. Van Z. (5035) on *Aphis* sp.with *Saissetia hemisphaerica* Targ. at Comerío (883-13).

**Baccha clavata** Fabricius

Roeder. Gundlach. Coquillett. Van Z. (P. R. 88).

Wolcott 22-7: short account, life-history, predaceous on aphids. Illustrations of larva, puparium and adult.

larvae feeding on aphids on okra (573-12), on *Aphis nerii* Boyer on milkweed (438-12), on *Toxoptera aurantiae* Boyer on grape-fruit (234-17), on *Aphis gossypii* Glover on cucumber (65-16), on *Macrosiphum illinoiense* Shimer on *Cissus sicyoides* (429-21).

**Baccha parvicornis** Loew

Roeder. Gundlach.

apparently from nymphs of a Fulgorid, *Ormenis pygmaea* Fabr., on coffee leaf (190-21); from white-flies on *Inga laurina* in plaza at Cabo Rojo (505-18); from leaf of *Erythrina glauca* infested with mealybugs, *Pseudococcus nipae* Mask. (70-23).

**Baccha (Ocyptamus) conformis** Loew

Roeder. Gundlach. Van Z. (P. R. 1207).

**Baccha (Ocyptamus) fasciatus** Roeder 85-342, TYPE from Porto Rico.

Gundlach, "observado solamente en Puerto Rico."

larvae feeding on aphids, *Toxoptera aurantiae* Boyer, on coffee, mountains north of Yauco (413-21), on *Aphis nerii* Boyer on milkweed at Yauco (59-22).

**Baccha (Ocyptamus) latiusculus** Loew

Roeder. Gundlach. Coquillett.

(as *Ocyptamus* sp.) Jones 15b-14: description of stages, as predator on *Sipha flava* Forbes on sugar cane. Colón 19-29.

larvae feeding on aphids, *Toxoptera aurantiae* Boyer, on grapefruit (38-17, 109-17, 392-12), on coffee in mountains north of Yauco (413-21); on *Sipha flava* Forbes on sugar cane (662-12); on *Aphis nerii* Boyer (438-12), at Yauco (56-22); on *Aphis gossypii* Glover on cucumbers (78-16); on *Aphis maidis* Fitch on corn (799-17).

**Baccha stenogaster** Williston—det. Greene

from mealybugs, *Phenacoccus gossypii* T. & C., on cotton at Maunabo (72-22).

**Toxomerus arcifer** Loew

Coquillett. Van Z. (P. R. 109).

swept from grass (76-12), at Manatí and Corozal (GNW).

**Toxomerus aurulentus** Williston—det. Greene

from Aibonito (SSC).

**Toxomerus basilaris** Wiedemann—det. Metcalf

swept from grass at Coloso, Caguas, Manatí, and Pt. Can-  
grejos (GNW).

**Toxomerus boscii** Macquart

(as *Mesograptia*) Stahl. Roeder. Gundlach.

**Toxomerus politus** Say—det. Cotton

Cotton 18-291: "Corn Feeding Syrphid Fly"—"very abundant  
on corn and some of the native wild grasses. The yellowish  
colored grubs feed on pollen grains and on the saccharine cells  
in the axils of the leaves. The grubs pupate between the stalk  
and the leaf-sheath. — parasitic enemies numerous."

larvae feeding on pollen of corn (578-17, 597-17).

**Toxomerus polygonastyla** sp. nov., ms. name of C. P. Metcalf, "be-  
cause of the peculiar shape of the styles on the male".

puparia common on tobacco at Cayey (114-21), larvae pos-  
sibly feed on small insects becoming stuck on leaves.

**Toxomerus laciniosus** Loew

Roeder. Gundlach. Coquillett.

common, swept from grass at Caguas, Ciales, and Manatí —  
det. Metcalf (GNW).

**Toxomerus minutus** Wiedemann

(as *Mesograptia*) Gundlach, "rara en Puerto Rico."

**Toxomerus subannulatus** Loew

Coquillett.

larvae on cane infested with *Sipha flava* Forbes (732-12);  
feeding on *Rhopalosiphum persicae* Sulz. on peppers (34-17);  
adults swept from grass at Caguas and Ciales (GNW).

**Allograptia limbata** Fabr.—det. Greene

larvae on cane infested with *Sipha flava* Forbes (710-12);  
larvae and pupae in arrows of sugar cane (81-19, 127-22, 60-  
23), at Cidra (29-21).

**Volucella esuriens** Fabr.

Roeder. Gundlach.

**Volucella obesa** Fabr.

Stahl. Roeder. Gundlach, "sumamente común en los montes."

Van Z. (P. R. 92).

at Añasco (1009-13), at Naguabo (734-14).

**Volucella pallens** Wiedemann

(as *V. sexpunctata* Loew) Stahl. Roeder. Gundlach.

Van Z. (P. R. 1204).

on flowers of *Cordia* (645-12, 225-13 det. Greene).

**Volucella pusilla** Macquart  
Roeder. Gundlach.

**Eristalis atrimanus** Loew.—det. Greene  
on *Cordia* flowers (644-12), on flowers near the beach at  
Pt. Cangrejos (605-17); resting on cane at Yauco (238-21).

**Eristalis albifrons** Wiedemann  
Roeder. Gundlach.  
(as *E. albiceps*) Wetmore 16-87, 89, 99; eaten by swallow, martin and Redstart.

**Eristalis pusio** Wiedemann  
Roeder. Gundlach.

**Eristalis vinetorum** Fabr.  
Stahl. Roeder. Gundlach.  
Van Z. (P. R. 96).  
on flowers at Aibonito (574-16), at Arecibo (442-13), at  
Añasco (1027-13), at Ponce (116-13).

**Meromacrus (Pteroptila) cinctus** Drury  
Roeder. Gundlach.  
Van Z. (P. R. 616).

**Meromacrus (Pteroptila) pratorum** Fabr.  
Roeder. Gundlach.

**Xylota pachymera** Loew  
Roeder. Gundlach.

CONOPIDÆ.

**Conops pictus** Fabr.  
Roeder. Gundlach.

**Zodion nanellum** Loew  
Roeder. Gundlach.

TACHINIDÆ.

**Gymnosoma filiola** Loew = **G. fuliginosa** Desvoidy  
Roeder. Gundlach.

**Compsilura oppugnator** Walton, W. R., "Four New Species of Tachinidae from North America" *In* Proc. Wash. Ent. Soc., Vol. 16, No. 2, pp. 93-95, June, 1914: from *Cirphis latiuscula* H. S. (88-12 TYPE).  
Jones 14-462; Jones & Wolcott 22-44.  
(88-12).

**Trichopoda flava** Roeder 85-343, TYPE from Porto Rico.  
Gundlach, "Parece ser propia de la isla."

**Trichopoda pennipes** Fabr.  
(as *T. pyrrhogastra* Wied.) Roeder. Gundlach.  
(as *T. pyrrhogaster* Wied.) Van Z. (P. R. 104).

**Cryptomeigenia aurifacies** Walton, W. R., "A New Species of Tachinidae from Porto Rico" *In* Proc. Ent. Soc. Wash., Vol. 14, No. 4, pp. 198-200, pl. x, Jan. 10, 1912.

(as sp.) Van Dine 12-18.

Van Dine 13-29; Van Dine 13-254; and Van Dine 13a-37: the latter the more complete account of rearing this parasite of *Lachnosterna* beetles from Añasco.

Van Z. (P. R. 5060).

Smyth 17-56, 86 to 87, 151: "The number of pupae found within one dead adult host varies from two to nine, usually four to six. Infested beetles that have died are always found in their burrows in the ground." Illustrations of adult and empty puparium.

Colón 19-50.

from adults of *Lachnosterna vandinei* Smyth and *L. portoricensis* Smyth at Añasco (356-12 TYPE, 519-12), at Pueblo Viejo (909-14), and generally throughout the moister portion of the island.

**Hypostena vanderwulpi** Townsend

Coquillett.

**Euzenillioptis diatraeae** Townsend—det., adults by Aldrich, pupae by Greene.

(as *Tachinophyto* sp.) Van Dine 13-254; Van Dine 13-29: parasite of *Diatraea saccharalis* Fabr.

(as *Hypostena* sp.) Van Dine 12-17. Jones 15c-15.

(as *Tachinophyto* sp.) Van Z. (P. R. 5019) from *Diatraea saccharalis* Fabr.

(as *Tachinophyto* sp. and *Hypostena* sp.—not in synonymy) Colón 19-41 and 42.

pupae found in tunnels of *Diatraea saccharalis* Fabr. (175-11, 217-11, 208-12, 904-13) reared from larvae of *Diatraea* (630-17, 694-17).

**Eutrixoides jonesii** Walton, W. R., "New North American Tachinidae (Diptera)" *In* Ent. News, Vol. 24, No. 2, pp. 49-52, pl. 1, Feb. 1913.

Van Dine 13-254; Van Dine 13-29 and Van Dine 13a-37: the latter the more complete account.

Smyth 17-56 and 151.

Colón 19-51.

from adults of *Lachnosterna vandinei* Smyth and *L. portoricensis* Smyth in the moister portions of the island, at Añasco (454-12 TYPE, 483-12, 504-12), less abundant than *Cryptomeigenia aurifacies*.

**Leskia analis** Say

Van Z. (P. R. 5055) from *Diaphania hyalinata* Linn.



**Belvosia bifasciata** Fabr.

Stahl. Roeder. Gundlach.

from pupae of *Herse cingulata* Fabr. at Hatillo (518-18).

**Belvosia luteola** Coquillett 00-253: TYPE from Vieques Id.

**Belvosia piurana** Townsend—det. Townsend

on flowers (639-12).

**Ocyptera atra** Roeder 85-344, TYPE from Porto Rico.

Gundlach.

**Ocyptera minor** Roeder 85-344, TYPE from Porto Rico.

Gundlach.

**Nemorilla maculosa** Macquart = **Exorista pyste** Walker—det. Aldrich.

from pupa of *Diaphania hyalinata* Linn. (489-16).

**Exorista amplexa** Coquillett—det. Aldrich

from larvae of *Ecpantheria eridanus* Cramer (560-16).

**Euphorocera claripennis** Macquart—det. Walton

Jones & Wolcott 22-49.

from larvae of *Remigia repanda* Fabr. at Santa Isabel (7-12).

**Exorista tassellata** Roeder 85-345, TYPE from Porto Rico

Gundlach.

**Frontina aletiae** Riley—det. Aldrich

from larva on *Inga laurina* at Lares (58-22).

**Frontina archippivora** Williston—det. Walton

Van Dine 13-31; Van Dine 13-257; Jones 13-235; Jones & Wolcott 22-47: as parasite of *Laphygma frugiperda* S. & A.

from *Laphygma frugiperda* S. & A. (74-12, 83-12, 84-12, 90-12, 738-12, 558-17, 585-17, 609-17), at Mameyes (822-12), at Arecibo (216-11), from pupa at Sabana Grande (444-21).

**Frontina rufifrons** Roeder 85-346, TYPE from Porto Rico.

**Zygosturmia** sp.—det. Aldrich

from Sphinx larva on *Cordia* (473-13).

**Sturmia (Argyrophylax) albincisa** Wiedemann—det. Walton & Townsend.

Cotton 17-113: from larvae of *Pachyzancla periusalis* Walker on tobacco.

Colón 19-36.

from larvae of *Pachyzancla periusalis* Walker (215-12, 797-16, 798-16, 957-16, 968-16, 88-19); from pupa of *Zinckenia perspectalis* Fabr. (1132-16); from *Nacoleia indicata* Fabr. (38-12); from *Mesoncondyla concordalis* Hübner (741-14).

**Linnaemyia fulvicauda** Walton 14-93, TYPE from Porto Rico.  
Jones 14-462; Jones & Wolcott 22-49: from *Remigia repanda* Fabr.

from *Remigia repanda* Fabr. (109-12 TYPE), at La Plata, Cayey (131-12), at Aibonito (SSC).

**Blepharipeza jurinioides** Townsend—det. Aldrich  
(unlabeled specimens.)

**Blepharipeza leucophrys** Wiedemann  
Gundlach.

(many unlabeled specimens, poss. from dead mouse (759-17).)

**Parachaeta bicolor** Macquart

(unlabeled specimens, poss. from dead mouse (759-17).)

**Winthemia quadripustulata** Fabr.—det. Aldrich

from pupa of Noctuid on sugar cane at Ponce (144-12).

**Gonia** sp.—det. Aldrich

from *Anticarsia gemmatilis* Hübner (877-14, 878-14).

**Gonia angusta** Macquart

Van Z. (P. R. 103) from *Lachnosterna* spp.

**Gonia crassicornis** Fabr.

Van Dine 13-31; Van Dine 13-257; Jones 13-235; Jones & Wolcott 22-47: from *Laphygma frugiperda* S. & A.

(450-12, 559-12); from *Laphygma frugiperda* S. & A. at Arecibo (8-12).

**Gonia pallens** Wiedemann

Roeder.

(as *Gonia chilensis* Macq.) Gundlach.

from *Xylomiges sunia* Guenee (762-16, 819-16).

**Peleteria robusta** Wiedemann

(as *Echinomyia*) Roeder. Gundlach.

**Archytas analis** Fabr.

from cutworm on tobacco at Aibonito (187-12).

**Archytas basifulva** Walker

Coquillett. Van Z. (P. R. 97).

**Archytas piliventris** V. d. Wulp—det. Walton

Van Dine 13-31; Van Dine 13-257; Jones & Wolcott 22-47; from *Laphygma frugiperda* S. & A.

from pupa of *Laphygma frugiperda* S. & A. (117-12, 558-12).

**Archytas (Nemochaeta) seminigra** Wiedemann

(as *Jurinia analis* Macq.) Roeder. Gundlach.

DEXIIDÆ.

**Phorostoma (Paramyiocera Rhynchodexia) rufianalis** V. d. Wulp  
Coquillett.  
in citrus grove at Pt. Salinas (178-15); on flowers at Pt.  
Cangrejos (603-17).

**Dexia strenua** Desvoidy  
Roeder. Gundlach.

SARCOPHAGIDÆ.

**Sarcophagula occidua** Fabr.  
Coquillett.  
on cattle dung (745-12—det. as *S. imbecilla* V. d. Wulp by  
Knab), from weeds (24-17), on corn leaves (257-21).

**Sarcophaga amoena** Aldrich—det. Aldrich  
(398-13), on leaves of corn (646-17); reared from injured  
snail from Lares (76-22).

**Sarcophaga bakeri** Aldrich  
Aldrich, J. M., "Sarcophaga and Allies in North America."  
Thomas Say Foundation, Lafayette, Ind., 1916, p. 270.  
on weeds (215-17) and from Mayagüez (Van Zwaluwen-  
burg, Coll.).

**Sarcophaga capitata** Aldrich 16-209, TYPE from Porto Rico, at  
Mayagüez and Arecibo.  
(243-17).

**Sarcophaga culminata** Aldrich 16-289, TYPE from Porto Rico, at  
Mayagüez.

**Sarcophaga diversipes** Coquillett 00-255, TYPE from Porto Rico.

**Sarcophaga lambens** Wiedemann  
Roeder. Gundlach. Coquillett.

**Sarcophaga helcis** Townsend  
(as *Helicobia*) Coquillett. Jones & Wolcott 22-49:  
from larva of *Remigia repanda* Fabr. at La Plata, Cayey  
(123-12).

**Sarcophaga peltata** Aldrich 16-216, TYPE from Porto Rico, at Na-  
guabo and Mayagüez.  
common among weeds (19-17), around grapefruit trees (559-  
17), on corn leaves (255-21).

**Sarcophaga plinthopyga** Wiedemann  
Roeder. Gundlach. Coquillett.

**Sarcophaga quatrissetosa** Coquillett  
Parker, Proc. Boston Soc. N. H., Vol. 35, p. 60 (as *Ravenia*).

**Sarcophaga robusta** Aldrich

Aldrich 16-268: from Mayagüez, P. R.

Jones & Wolcott 22-49: from pupae of *Remigia repanda* Fabr. and from white grubs.

(452-12, 766-12, 717-14), from dead spider (5-14); from dead *Lachnosterna* beetles (472-12, 702-16), at Añasco (400-12, 445-12, 446-12, 453-12, 467-12, 488-12), at Guánica (547-13); from grubs of *Lachnosterna portoricensis* Smyth (735-17); from pupae of *Remigia repanda* Fabr. at Guánica (657-14), at Mameyes (812-12); five adults from one pupa of *Laphygma frugiperda* S. & A. (557-17); from sphinx moth larva at Yauco (410-21); from pupae of *Alabama argillacea* Hübner at Hatillo (213-22, 214-22); from dead sphinx moth at Caguas (SSC); from dead changa, *Scapteriscus vicinus* Scudd. at Patillas (1206-13); from dead cockroach (627-21). Adults at Toa Baja (140-13), at Añasco in coffee grove (348-13), swept from grass at Morovis (GNW).

## MUSCIDÆ.

**Cochliomyia (Paralucilia Chrysomyia) macellaria** Fabr.

(as *Chrysomyia*) Roeder. Gundlach. Coquillett. Van Z. (P. R. 1214).

Stevenson 18-150: host for fungus, *Cordyceps dipterygena* Berk. & Br.

on dung (20-17), on grapefruit tree at Vega Alta (116-17), on leaves of corn at Aguadilla (227-22), at Fajardo (394-21); attracted to gasoline (736-17).

**Ormia punctata** Desvoidy

Roeder. Gundlach.

at Pt. Cangrejos (GNW); at Aibonito (575-16 det. Aldrich).

**Lucilla caesar** Linn.

Coquillett.

**Lucilla ruficornis** Macquart

Roeder. Gundlach, "común."

**Lucilla semiviolacea**. Bigot, J., "Dipteres nouveaux ou peu connus."

In Annales Soc. Ent. France, No. 9, pt. 7, 1877, p. 46: TYPE from Porto Rico (as *Somomyia*).

**Pyrellia ochricornis** Wiedemann.

Stahl. Roeder. Gundlach. Coquillett.

on dung (21-17), in citrus grove at Vega Alta (117-17); larvae in wet decaying vegetation (436-17).

**Pyrellia scapulata** Bigot

on corn leaves (254-21), on underside of coffee leaves (267-21).

**Parapyrellia (Morellia) violacea** Fabr.

(as *Pyrellia centralis* Loew) Roeder. Gundlach.

(as *Pyrellia*) Wetmore 16-84: eaten by Wood Pewee, *Blacicus blacoi*.

in coffee grove at Ciales (GNW).

**Musca domestica** Linn.

Stahl. Roeder. Gundlach. Coquillett. Van Z. (1717).

(151-11), larvae in rotten palm tree from Añasco (116-22).

**Synthesiomyia nudiseta** V. d. Wulp = **S. grasiliana** B. & B.—det. Aldrich.

(430-12, 347-17.)

**Stomoxys calcitrans** Linn.

Roeder. Gundlach. Coquillett. Van Z. (1727) on cattle.

(18-17, 23-17.)

**Haematobia irritans** Linn.

(as *Hyperosia*) Van Z. (1711) attacks cattle.

(as *H. serrata* Desv.) Merrill 15-53 to 55: life history and bionomics in P. R., parasites, predators and comensals of larvae.

(as *H. serrata* Rob. Desv.) Colón 19-34 and 35: summary.

(as *H. serrata*) Smyth, E. G., "La Mosca del Ganado (the Horn Fly)" Circ. 39, Insular Expt. Sta., pp. 1-17, pl. 4, February 1912: a compilation of remedies.

(as *H. serrata* Desv.) Wolcott 22d-18: a short account, comensals with and parasites of larvae in P. R.

Common on dry (southern) side of the Island, less abundant on the moist (northern) side, breeding in fresh cattle dung, adults attacking cattle.

**Neomuscina tripunctata** V. d. Wulp = **N. cavicola** Townsend

(as *Muscina*) Coquillett.

ANTHOMYIDÆ.

**Atherigona pulvinata** Grimshaw

reared from decaying eggplant (129-16).

**Ophyra aenescens** Wiedemann

Roeder. Gundlach.

**Limnophora arcuata** Stein

Coquillett.

**Limnophora corvina** Giglio-Tos

swept from weeds (25-17).

**Coenosia varicornis** Coquillett 00-256, TYPE from Porto Rico.

**Lispa ruftibialis** Macquart

Coquillett.

**Fucellia maritima** Haliday

(as *F. fucorum* Fallen) Howard, L. O., Proc. Wash. Acad. Sci.,  
Vol. 2, p. 599.

**Bithoracochaeta despecta** Walker

swept from grass at Corozal (GNW).

## SCATOPHAGIDÆ.

**Scatophaga exotica** Wiedemann

Coquillett: from Culebra Id.

## BORBORIDÆ.

**Limosina fontinalis** Fallen

Coquillett.

**Limosina lugubrina** Malloch, J. R., "Descriptions of New Species  
of American Flies of the Family Borboridae" Proc. U. S.  
Nat. Mus., Vol. 44, No. 1958, pp. 361-372, Feb. 20, 1913,  
Washington, D. C. TYPE from Porto Rico.

**Limosina perparva** Williston

Coquillett.

**Limosina lugubris** Williston

Coquillett.

**Limosina rotundipennis** Malloch 13-361, TYPE from Porto Rico.

**Limosina venalicia** Osten Sacken

Coquillett.

**Limosina viveipennis** Malloch 13-361, TYPE from Porto Rico.

## SCIOMYZIDÆ.

**Sepedon macropus** Walker

Roeder. Gundlach.

## SAPROMYZIDÆ.

**Lonchaea longicornis** Williston

Coquillett.

**Lonchaea glaberina** Wiedemann

Van Z. (P. R. 1664) from pods of *Inga vera*.

**Lonchaea chalybea** Wiedemann

Barrett 04-447: on *Manihot utilissima* and *M. palmata*.

Barrett 05-396: larva "a serious pest in the tips of cassava  
canes." Handpicking and tobacco dust in dry seasons as  
control.

larvae in terminal shoots of cassava at Manatí (157-13);  
a common, and at times, a serious pest, reported by Agr.  
Agents at Sabana Grande and Aguadilla.



**Physogenua ferruginea** Schiner

in coffee groves at Lares (391-21), at Ciales (GNW).

**Physogenua cittata** Macquart

(as *Lauxania variegata* Loew) Stahl. Roeder. Gundlach.

**Lauxania albobittata** Loew

Roeder. Gundlach.

**Sapromyza cincta** Loew

Roeder. Gundlach.

**Sapromyza octopunctata** Wiedemann

Roeder. Gundlach.

swept from grass at Morovis (GNW).

**Sapromyza sordida** Wiedemann

Coquillett.

**Sapromyza valida** Walker = **S. macula** Loew—det. Aldrich  
(1042-16.)

**Trigonometopus** sp. nov.—det. Aldrich

resting on coffee leaf in mountains north of Yauco (242-22).

ORTALIDÆ.

**Tetanops** sp.

Wetmore 16-66: eaten by Tody, *Todus mexicanus*.

**Ortalis quadrivittata** Macquart

Stahl.

**Acrosticta apicalis** Williston—det. Aldrich

resting on corn (257-21).

**Euxesta annonae** Fabr.

Roeder. Gundlach. Van Z. (det. Knab).

**Euxesta apicalis** Williston

Coquillett.

**Euxesta costalis** Fabr.

Roeder. Gundlach.

**Euxesta spoilata** Loew

Roeder. Gundlach. Coquillett.

**Euxesta stigmatias** Loew

Roeder. Gundlach. Coquillett.

**Euxesta thomae** Loew

Coquillett.

Wolcott 21-42: common in cane fields, around cane cars and on human feces. Illustration of adult.

adults on stems of *Agati grandiflora* at Añasco (1101-13) at Aibonito (SSC), at Manatí, Coloso, Guánica and Patillas (GNW).

**Stenomacra guerini** Bigot  
Roeder. Gundlach.

## TRYPETIDÆ.

**Toxotrypana curvicauda** Gerstaecker

Hooker 13-36: "Abundant at Mayagüez. — The eggs are laid well below the surface of the green fruit (of papaya, *Carica papaya*); 2 to 15 or more larvae mature within the fruit, and when it drops, pupate 1 or 2 inches below the surface of the ground below the fruit. Adults emerge in 17 to 21 days, and eggs for another brood are soon laid."

Van Z. (1243) in *Carica papaya*.

**Anastrepha fraterculus** Wiedemann—det. Bezzi for Hooker.

(as *Acrotoxa*) Roeder. Gundlach.

(as *A. acidusa* Walker) Tower 12-34 and 35: in fruit of imported mangoes, especially the Cambodiana variety. Life history.

Hooker 13-36: "in one of the native mangoes (mango de puerco) — in guava (*Psidium guajava*), jobo amarillo (*Spondias lutea*), and jobo de la India fruit. — The larvae in (the fruit of) jobo (*Spondias lutea*) are commonly attacked by two hymenopterous parasites, *Opius* (*Utetes*) *anastrephae* n. sp. (Viereck) and *Ganaspis* n. sp. (det. Crawford)."

Van Z. (1202) in guayaba, mango, *Spondias lutea*.

Van Zwaluwenburg 18-34: "a heavy infestation — near Maricao in July (1917) in pomarosa fruits, *Eugenia jambos*."

adults resting on grapefruit (555-17), on corn leaf (253-21), on coffee leaf (264-21); larve from fruit of guava, *Psidium guajava*, at Ciales (893-13); from fruit of jobo, *Spondias lutea*, (67-16), from mango, *Mangifera indica*, (305-12).

**Polymorphomyia bascilica** Snow—det. Aldrich

from elongate gall on stem of *Eupatorium odoratum* (39-17).

**Aciura insecta** Loew

Roeder. Gundlach.

Wolcott 21-42: adults resting on cane leaves at Coloso, Aguada, Camuy, Arecibo, Manatí and in "hills of north and west coast" of the Island.

resting on corn leaves (502-17), at Aguadilla (226-22).

**Ensina humilis** Loew

Roeder. Gundlach.

Wolcott 21-42: adults resting on cane at San Sebastián, Manatí, Corozal and other localities in "hills of north and west coast" of the Island.

**Ensina perigrina** Loew

Coquillett.

**Euaresta melanogaster** Loew

Roeder. Gundlach.

resting on grapefruit at Vega Alta (231-17) swept from grass in coffee grove at Ciales (68-21), and at Caguas (GNW).

**Euaresta mexicana** Wiedemann

Van Z. (P. R. 106).

**Urellia solaris** Loew—det. Aldrich

common on malojillo, *Panicum barbinode*, grass at Pt. Can- grejos and on cane at San Sebastián (GNW).

MICROPEZIDÆ.

**Nerius cinerius** Roeder 85-348, TYPE from Porto Rico.

**Micropeza limbata** Roeder 85-347, TYPE from Porto Rico.  
Gundlach.

**Calobata fasciata** Fabr.

(as *Taeniptera*) Stahl.

Roeder. Gundlach, "común".

Coquillett, (on human excrement, Howard).

**Calobata lasciva** Fabr.

(as *Taeniptera*) Stahl.

Roeder. Gundlach. Coquillett. Wolcott 21-41: "common in cane fields—reared from old cane stalks." Illustration of adult.

adults on cane leaves at Arecibo (187-11), at Manatí (65-15), at Toa Alta (452-21), at San Sebastián, Guayanilla (GNW); reared from larvae in decaying cane cuttings (124-12) and in dry cane stalk (2-21).

**Calobata** sp.

Adults with chestnut-red head and thorax, black abdomen, wings clear except for distal angle and medio-distal quarter.

at Vega Alta 105-17); in coffee groves in mountains at Ciales (461-21), at Utuado (479-21) and at Adjuntas (90-22).

SEPSIDÆ.

**Sepsis discolor** Bigot

Roeder. Gundlach, "muy rara".

**Sepsis insularis** Williston

Coquillett.

EPHYDRIDÆ.

**Notiphila erythroceræ** Loew

Roeder. Gundlach.

**Notiphila virgata** Coquillett 00-259, TYPE from Porto Rico.

**Paralimna decipens** Loew  
Coquillett.

**Paralimna obscura** Williston  
Coquillett.

**Ptilomyia enigma** Coquillett 00-261, TYPE from Porto Rico.

**Allotrichoma abdominalis** Williston  
Coquillett.

**Psilopa aciculata** Loew  
Coquillett.

**Psilopa mellipes** Coquillett 00-260, TYPE from Porto Rico.

**Psilopa nigrimana** Williston  
Coquillett.

**Ptythea flavipes** Williston  
Coquillett.

**Ptythea ? oscitans** Walker (*Ephydra*)  
Coquillett.

**Athyrolossa nitida** Williston  
Coquillett.

**Discocerina leucoprocta** Loew  
Coquillett.

**Discocerina parva** Loew  
Coquillett.

**Hydrellina glivipes** Coquillett 00-261, TYPE from Porto Rico.

#### OSCINIDÆ.

**Chlorops trivittata** Williston  
Coquillett.

**Hippelates apicata** Malloch, J. R., "The Genera of Flies of the Subfamily Botanodiinae with hind tibial spur." Proc. U. S. Nat. Mus. Vol. 46, No. 2024, pp. 242-255. Dec. 6, 1913, Washington, D. C., TYPE from Porto Rico, p. 248.

**Hippelates convexus** Loew  
Coquillett. Malloch 13-249.

**Hippelates flavipes** Loew  
Coquillett. Van Z. (1712).  
(1054-16).

**Hippelates nudifrons** Malloch 13-242, TYPE from Porto Rico.

**Hippelates pusio** Loew  
Coquillett.

**Hippelates peruanus** Becker  
Malloch 13-244.

**Hippelates tener** Coquillett  
Malloch 13-255.

**Hippelates texanus** Malloch—det. Aldrich  
Wolcott 21-42: “ ‘Mimis’—abundant on cane at Guánica—  
often in great abundance in cane fields at many other places  
in the dryer parts of Porto Rico.”  
• Annoying to man and animals, buzzing about and resting  
on ears, nose, mouth and eyes.

**Pseudogaurax lancifer** Coquillett, 00-265, TYPE from Porto Rico:  
reared from egg-sacs of spiders.  
from eggs of spider, *Gasteracanthia cancriformis* Linn. (333-  
21) and at Pt. Cangrejos (GNW).

**Oscinis anonyma** Williston  
Coquillett.

**Oscinis coxendix** Fitch  
Coquillett.

**Oscinis nana** Williston  
Coquillett.

**Oscinis obscura** Coquillett 00-266, TYPE from Porto Rico.

**Oscinis quadrilineata** Williston  
Coquillett.

**Oscinis umbrosa** Loew  
Coquillett.

**Oscinis virgata** Coquillett  
Coquillett.

DROSOPHILIDÆ.

**Sigaloessa bicolor** Loew  
Coquillett.

**Drosophila funebris** Fabr.  
Coquillett.

**Drosophila fusca** Coquillett 00-264, TYPE from Porto Rico.

**Drosophila melanogaster** Meigen  
Van Z. (P. R. 110).  
in decaying oranges (599-16).

**Drosophila vittata** Coquillett  
Coquillett.

**Drosophila** sp.—det. Aldrich  
from ovary of flower of “tibey”, *Isotoma longiflora*, (490–21).

**Stenomicroa angustata** Coquillett 00-262, TYPE from Porto Rico.

**Cladochaeta nebulosa** Coquillett 00-263, TYPE from Porto Rico.

GEOMYZIDÆ.

**Anthomyza nigrimanus** Coquillett

AGROMYZIDÆ.

**Agromyza aeneiventris** Fallen  
Coquillett.  
“probably *caerulea*” Aldrich.

**Agromyza caerulea** Malloch—det. Aldrich  
from stem of *Eupatorium odoratum* (341-16); from morning  
glory seeds (141-17).

**Agromyza diminuta** Walker = **A. pusila** Mg.  
Coquillett.

**Agromyza inaequalis** Malloch, J. R., Proc. Wash. Ent. Soc., Vol.  
XVI, No. 2, pp. 89-90, fig. 1. June, 1914: from leaves of  
*Vigna repens* (983-13 TYPE & 1137-16).  
from leaves of lima beans (722-17 det. R. T. Cotton).

**Agromyza insularis** Malloch—det. Aldrich  
from seed pods of Chinese mustard (699-17).

**Agromyza maculosa** Malloch—det. Aldrich  
from leaves of aster (211-22).

**Agromyza minima** Malloch, J. R., “Revision of Species of *Agromyza*”, Ann. Ent. Soc. Amer., Vol. VI, No. 3, p. 328. TYPE  
from Porto Rico.

**Agromyza parvicornis** Loew—det. Walton  
from leaves of corn (719-12).

**Agromyza neptis** Loew  
Coquillett.

**Agromyza jucunda** V. d. Wulp—det. Malloch  
Coquillett.  
from leaves of *Eupatorium odoratum* (1204-13, 1139-16).



**Agromyza plumiseta** Malloch, J. R., Ann. Ent. Soc. Amer., Vol. VI, No. 3, p. 324. TYPE from Porto Rico.

**Agromyza setosa** Loew  
Coquillett.

**Agromyza viridula** Coquillett, D. W., "New Acalyptrate Diptera from North America," Jour. N. Y. Ent. Soc., Vol. X, pp. 190, Dec. 1902. TYPE from Porto Rico.

**Desmometopa halteralis** Coquillett 00-267, TYPE from Porto Rico.

**Milichia indecora** Loew  
Coquillett.

**Ophthalmomyia cineria** Coquillett 00-268, TYPE from Porto Rico.

**Ophthalmomyia lacteipennis** Loew  
Coquillett.

**Leucopis bella** Loew  
Coquillett; from larvae feeding on *Dactylopius (Pseudococcus) citri*.  
from *Pulvinaria psidii* Mask., on jobo (*Spondias lutea*) tree at Arroyo (173-12).

**Cerodonta dorsalis** Loew  
Coquillett.  
from mine in corn leaf (513-17).

#### HIPPOBOSCIDÆ.

**Ornithoctona erythrocephala** Leach  
(as *Ornithomyia cryptocephala* Leach) Stahl.  
Roeder. Gundlach, "Se encuentra en aves de diferentes familias."  
Coquillett: on sparrow hawk.  
collected by Mr. Alex Wetmore on sparrow hawk at Aibonito and Cabo Rojo; on P. R. Dove at Caguas, Jan. 8, 1911.

**Lynchia maura** Bigot—det. Aldrich  
from domestic pigeon (8-21).

**Olfersia albipennis** Say  
collected by Mr. Alex Wetmore at Río Piedras, Dec. 22, 1916.

**Melophagus ovinus** Linne  
Van Z. (P. R. 91) on sheep.

#### STREBLIDÆ.

**Trichobius dugesii** Townsend  
(as *Strebla vespertilionis* (as Fallen) Fabr.) Gundlach, "Vive sobre los murciélagos."  
Coquillett.

**Aspidoptera buskii** Coquillett, D. W., "New Genera and Species of Nycteribidae and Hippoboscidae", Can. Ent., Vol. XXXI, pp. 333-336, Nov. 1899. TYPE from Bayamón, P. R., on bats (*Artibeus* sp.)

**Pterellipsis araeneae** Coquillett, D. W., 90-334, TYPE from Porto Rico: on bats.



## SIPHONAPTERA.

**Ctenocephalus canis** Curtis

Van Z. (1708) on dog.

**Ctenocephalus felis** Bouché

Van Z. (1718) on rat.

**Dermatophilus penetrans** Linnaeus

(as *Pulex*) Stahl — “nigua”.

(as *Sarcopsyllus*) Van Z. (1715) on man.

Common on man, usually after bathing on sandy beaches (Condado and Pt. Cangrejos), occasionally abundant on clay soil under houses. Supposed to cause large scabs on hogs.

**Echidnophaga gallinacea** Westwood

(as *Sarcopsylla*) Van Z. (1719) on rat and fowls.

**Pulex irritans** Linnaeus

Stahl — “pulga”.

on man at Pt. Cangrejos—det. F. C. Bishopp.

**Xenopsylla cheopis** Rothschild

Van Z. (1714) on rat.



## THYSANOPTERA.

### THRIPIDÆ. THRIPS.

Determinations of thrips have been made by Mr. H. M. Russell, Mr. J. D. Hood and Mr. A. C. Morgan.

#### LITERATURE.

**Hood, J. D.**, "On a Collection of Thysanoptera from Porto Rico."  
*In* Insecutor Inscitiae Menstrus, Vol. 1, No. 12, pp.  
149-154, December, 1913.

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**Dinurothrips hookeri** Hood 13-149, TYPE from Porto Rico.  
Van Z.

**Frankliniella insularis** Franklin (= *Euthrips*)  
Hood 13-149. Van Z. Wetmore 16-72: eaten by Green Mango,  
*Anthracothonax viridis*.  
on flowers of roble, *Tecoma pentaphylla* (265-12 det. Rus-  
sell).

**Frankliniella williamsi** Hood—det. A. C. Morgan  
(as *Frankliniella* sp.) Smyth 19-138: the yellow cane thrips.  
(as "yellow thrips of cane") Wolcott 21-13: abundant inside  
the central whorl of leaves during extended droughts.  
on sugar cane at Guánica (140-21, 8-22), at Barceloneta  
(7-22).

**Gynaikothrips uzeli** Zimmermann  
Hood 13-149. Van Z.

**Haplothrips gowdeyi** Franklin  
Hood 13-149. Van Z.

**Haplothrips tibialis** Hood, J. D., "Two Porto Rican Thysanoptera  
from Sugar Cane" *In* Insecutor Inscitiae Menstruus Vol. 2,  
No. 3, pp. 38-41, March, 1914: TYPE from Porto Rico.  
Jones 14-463: on sugar cane, reference to description by Hood.  
Smyth 19-138: the black cane thrips.  
(as "black thrips") Wolcott 21-13: note.  
on sugar cane (8-14 det. Hood, 17-14), at Guánica (141-  
21), not abundant.

**Haplothrips femoralis** Reuter  
Hood 14-38. Van Z.  
Jones 14-463: one specimen on sugar cane.  
on sugar cane (8-14 det. Hood).



**Heliothrips haemorrhoidalis** Bouche

Hood 13-149. Van Z.

on orange leaves at La Muda (68-20 det. Smyth).

**Heliothrips rubrocinctus** Giard—det. Russell

(as *Selenothrips*) Hood 13-149. Van Z.

on leaves of jobo, *Spondias lutea* (687-12 det. Russell, 721-16), of *Acalypha wilkesiana* (34-20), very injurious to young leaves of mango.

**Heterothrips sericatus** Hood, J. D., "Two New Thysanoptera from Porto Rico," *In* Insecutor Inscitiae Menstruus, Vol. 1, No. 6, pp. 65-70, pl. 1, June, 1913: TYPE from Porto Rico.

Van Z.

in blossoms of *Psidium guajava* (507-12 det. Russell).

**Mesothrips ficorum** Marchal = **Liothrips bakeri** Crawford

Russell, H. M., "The Red-Banded Thrips" Bull. 99, pt. II, pp. 17-29, 1912. Bureau of Entomology, U. S. Dept. Agr., Washington, D. C.: on *Ficus* in Porto Rico, footnote, p. 17.

Hood 13-65: Van Z.

on leaves of *Ficus nitida* (18-12 det. Russell), common on this host in the plazas at San Juan, Río Piedras and Guayama.

**Podothrips semiflavus** Hood 13-65, TYPE from Porto Rico.

Van Z. Smyth 19-138: on sugar cane and Para (malojillo) grass.

on malojillo grass, *Panicum barbinode* (227-12 det. Russell) at Guánica.

**Thrips tabaci** Lindemann—det. Russell.

Jones 15-2: on onion.

Cotton 18-303: very destructive to onions. Notes.

on onions (508-12 det. Russell), at Mayagüez and Sabana Grande (Agr. Agents); on *Solanum torvum* (63-17 det. Smyth).

**Ommatothrips** sp. nov.

Wetmore 16-111: eaten by Reinita, *Coereba portoricensis*.

## HEMIPTERA.

Mr. Otto Heidemann made the earlier determinations of Hemiptera on which the original records in this section are based, and Mr. E. H. Gibson those at a later period, besides describing two species of *Dicyphus* which feed on tobacco. More recently Mr. W. L. McAtee of the Bureau of Biologic Survey has made many determinations, and to him the writer is also indebted for references to literature.

Of the families, Dr. W. D. Funkhouser has determined the Membracidae, Mr. F. Muir of the Experiment Station of the Hawaiian S. P. A., the Fulgoridae, and in the Jassidae (Cicadellidae) Dr. E. D. Ball and Prof. Z. P. Metcalf made some of the determinations, while more recently Prof. D. L. DeLong has redetermined and described a considerable number of species. Dr. A. L. Quaintance, with Dr. A. C. Baker, have determined the Aleyrodidae, and although they have published descriptions of a number of new species from Porto Rico, the descriptions of several others are still in manuscript. The earliest authoritative determinations of the Aphididae were by Mr. J. J. Davis, later determinations have been made by Mr. H. F. Wilson, Dr. Edith M. Patch and Dr. A. C. Baker. Mr. E. R. Sasser and Mr. E. W. Rust determined all the earlier collections of Coccidae, but Mr. Harold Morrison and Prof. G. F. Ferris have made the more recent determinations and both have described one (the same) new species from Porto Rico.

### LITERATURE.

**Barber, H. G.,** "A Preliminary Report on the Hemiptera-Heteroptera of Porto Rico Collected by the American Museum of Natural History" American Museum Novitates, No. 75, May 11, 1923, pp. 1-13. (The new species described and the others which are listed in Mr. Barber's paper are not noted below as it was received after the manuscript had been sent to the printer.)

### CORIXIDÆ.

**Corixa reticulata** Guerin

Gundlach.

(as sp.) Wetmore 16-29, 40, 41, 43, 45, 61, 63, 128: eaten by Lesser Scaup Duck, Killdeer, Sandpipers, Wilson's Snipe, Ani,

Woodpecker and Grasshopper Sparrow, and of the Lesser Yellow-Legs at Cabo Rojo it constituted 57.5% of the stomach contents, and of the Black-Necked Stilt over 50%.

NOTONECTIDÆ.

**Notonecta** sp.

Wetmore 16-41, 44, 61: eaten by Sandpipers and Ani.

**Plea** sp.

Wetmore 16-41, 100: eaten by Sandpiper and Water Thrush.

**Plea striola** Fieber

Wetmore 16-35, 75: eaten by Gallinule and Black Swift.

BELOSTOMIDÆ.

**Belostoma medium** Guerin

Stahl. Gundlach.

at light (34-12, 122-12, 1043-16), at Yauco (408-14).

**Zaitha anura** Herrich Schaeffer

Gundlach, "en las lagunas."

at light (87-15, 1043-16 — abundant Oct. 25), at Condado (90-16), at Humacao (61-13), at Guánica in abundance (585-October 2, 1913), at Mayagüez (520-12), unlabeled specimens det. McAtee.

SALIDÆ.

**Micranthia humilis** Say—det. McAtee

on weeds at Ciales (649-21).

REDUVIIDÆ.

**Zelus longipes** Linnaeus

AMNH at San Juan.

(114-13), at Trujillo Alto (726-12); feeding on larvae of *Haltica jamaicensis* Fabr. (152-13); at Yabucoa with *Tachytes argentipes* Smith on its beak (158-16); in mountains north of Yauco feeding on *Alysia analis* Cresson (43-23); at Aibonito (SSC).

**Zelus rubidus** Lap. & Serv.

(as *Evagoras tricolor* L. & S.) Stahl.

Gundlach.

Wetmore 16-77: eaten by Grey Kingbird, *Tyrannus domingensis*. Van Z. (5033) predaceous on cutworms and flies.

Jones 14-462: attacking the larvae of *Laphygma frugiperda* S. & A.

(642-12, 144-17), eating *Diabrotica graminea* Baly and a small fly (180-11), eating a small fly (193-11), eating *Lucidiotia decorus* G. & H. (678-12); often common on spikes of *Achryanthus indica* waiting for flies to alight (GNW); on corn at Caguas (129-11 det. Heidemann); at Arroyo (12A-19); at Hatillo (123-18); at Yauco (772-15).

**Zelus subimpressus** Stal  
(as *Diplodus*) Gundlach.

**Zelus nugax** Stal—det. McAtee  
(as sp.) Wetmore 16-61, 77, 80: eaten by Ani, Kingbird and Petchary.

(58-11, 854-14), on sugar cane (325-12, 604-12), at Arcicibo (635-21), at Toa Alta (454-21), at Rincón (GNW); on grass and weeds (236-16), at Pt. Cangrejos (GNW); on grapefruit foliage at Vega Baja (512-16), all stages at Vega Alta (102-17, 219-17); on *Inga laurina* at Lares (261-22).

**Rocconota** sp.  
Wetmore 16-80: eaten by Petchary, *Tolmarchus taylori*.

**Stenopoda cinerea** Laporte  
Stahl.

**Stenopoda culiciformis** Fabricius  
Gundlach.  
(284-12).

## EMESIDÆ.

**Ploiariodes rubromaculata** Blackburn—det. McAtee  
feeding on thrips on foliage of *Spondias lutea* (728-16),  
on mosquitos on walls of house (622-16).

**Ploiariodes armata** Champion—det. McAtee  
on foliage of grapefruit at Vega Alta (222-17).

**Emesa affinis longipes** DeGeer  
Gundlach, determined by Dr. Uhler.  
(as sp.) Wetmore 16-119: eaten by Mozambique.

**Westermannia tenenima** Dohrn, A., in *Linnaea Entomologica*, Vol. 15, pp. 48-49, 1863, TYPE from Porto Rico.

**Ghilianella varicornis** Dohrn, A., in *Linnaea Entomologica*, Vol. 14, pp. 226-227, 1860, TYPE from Porto Rico.

## ANTHOCORIDÆ.

**Asthemidea picta** Uhler (?)—det. H. G. Barber  
in buds of *Partium tiliaceum* at Arcicibo (249-22).

**Lasiochilus divisus** Champion  
Wolcott 21-14: "The Pink Leafsheath Bug. All stages . . .  
under the older green leaf-sheaths of high cane." Illustration of adult.

under leaf-sheaths of sugar cane (194-11, 201-11 det. Heide-  
mann), possibly predaceous on mites, *Tarsonemus spinipes*  
Hirst (721-13), at Barceloneta (GNW—det. Gibson).

**Triphleps insidiosus** Say

(312-12), on squash leaves (518-17), on corn, presumably predaceous on *Aphis maidis* Fitch (536-12 det. Heidemann), on red spider on beans (427-16); under leaf-sheaths of sugar cane at Arecibo (1068-16 det. McAtee); at Isabela on red spider on cotton (214-21).

CIMICIDÆ.

**Cimex lectularius** Linnaeus

(as *Acanthia*) Stahl, "chinche de cama."  
Van Z. (1704).

GERRIDÆ.

**Tenagogonus (Limnometra) quadrilineatus** Champion—det. Heidemann.

Van Z.

**Limnogonus marginatus** Guérin

(as *Gerris*) Stahl. Wetmore 16-22: eaten by Cuban Green Heron.

(as *Limnotrechus*) Gundlach.

AMNH at Coamo.

on water in ditch (712-16); at light at Guánica (614-13).

VELIDÆ.

**Mesovelgia** sp.

Wetmore 16-41: eaten by Spotted Sandpiper.

**Microvelgia albonotata** Champion—det. McAtee

(as sp.) Wetmore 16-40, 41: eaten by Killdeer and Spotted Sandpiper.

on surface of water (250-16); at light (203-11), at Guánica (EGS).

**Microvelgia pulchella** Westwood

Gundlach.

**Rhagovelgia angustipes** Uhler

AMNH at Naguabo and Maricao.

MIRIDÆ (CAPSIDÆ).

**Bolbosia deflexa** Uhler MS—det. Gibson

from weeds in cane field (385-12).

**Dicyphus luridus** Gibson, E. H., "Two New Species of *Dicyphus* from Porto Rico" in Canadian Entomologist, Vol. 49, No. 6, pp. 218-19, June 1917, TYPE from Porto Rico.

Cotton 17-113 to 118, pl. 1 with 8 figs.: "The Large Tobacco Suck-Fly", illustrations and descriptions of all stages, life history and control.

on tobacco (346-17), at Ciales (782-13), at Juncos (153-

16), at Aibonito (323-17 TYPT), at Cayey (127-16); on tomato (201-16); on *Jathropha gossypifolia* at Martin Peña (842-14); on *Amaranthus spinosus* at Cayey (127-16).

**Dicyphus prasinus** Gibson 17-218, TYPE from Porto Rico.

Cotton 17-119, fig. 1: notes. "Smaller and more slender (than *D. luridus* with) 'a large, irregular fuscous spot near the costal margin of each wing-cover and midway between base and apex', not so abundant on tobacco, --- more frequently on tomato."

on tobacco at Aibonito (324-17 TYPE), at Cayey (320-17); eggs in the midrib of tobacco leaves (345-17).

**Nabidea (Collaria) explicata** Uhler—det. McAtee

nymphs and adults on rice at Canóvanas (196-16); on weeds (426-17).

**Crenotiades rubinervis** Stal

AMNH at San Juan and Arecibo.

**Trigonotylus** sp.—det. McAtee

abundant on Bermuda grass (262-21).

**Lygus apicalis** Fieber—det. McAtee

on carrots (526-17), on weeds (428-17); on tender growth of *Inga laurina* at Lares (167-22).

**Lygus sallei** Stal

Gundlach.

**Poeciloscytus cuneatus** Uhler—det. McAtee

(311-12), on beans and tomatoes (200-16), on *Amaranthus*, *Verbesina alba* and other weeds (427-17, 502-16), on carrots (527-17); on tobacco at Cayey (37-16, 126-16); on sugar cane at Guánica (GNW).

**Pycnoderes incurvus** Distant—det. Gibson

Cotton 18-306: "The Small Black Squash Bug", illustration and notes. "All stages on squash and melon vines --- small translucent, flask-shaped eggs are inserted in the tissue of the stems and large veins of the leaves, and hatch in a few days into small, wingless, greenish-white nymphs. --- feed on the underside of leaves --- moulting five times --- retain greenish-white color until they become adults."

on squash and cucumber (643-17).

**Pycnoderes quadrimaculatus** Uhler

Gundlach, "no es rara en el *Solanum torvum*."

"Apparently a new species of '**Fuscus** Distant' "—det. McAtee.

on foliage of grapefruit at Vega Alta (220-17).



## PHYMATIDÆ.

**Phymata angulata**

Wetmore 16-61: eaten by Ani.

**Phymata erosa** Linnaeus

Gundlach.

**Phymata marginata** Fabricius

Gundlach.

(as sp.) Wetmore 16-66, 98, 102, 114: eaten by Tody, Jamaican Vireo, Prairie Warbler and Yellow-Shouldered Blackbird.  
at Comerío (758-13 det. McAtee).

**Macrocephalus bergrothi** Handl.—det. McAtee

on *Inga laurina* at Lares (155-22).

**Macrocephalus granulatus** Champion—det. McAtee

(as sp.) Wetmore 16-66: eaten by Tody, *Todus mexicanus*.  
on coffee at Lares (287-21).

## TINGITIDÆ.

**Leptopharsa illudens** Drake = **Atheas pallidus** Barber 23-6, TYPE from Porto Rico.

(as *Atheas nigricornis* Champion—a misidentification according to Dr. Drake) Barrett 05-396: on cassava, *Manihot* sp.  
on "yuca", *Manihot* sp. (309-23 det. Drake).

**Corythuca gossypii** Fabricius—det. Heidemann

Van Z. (1254) on *Carica papaya*, *Anana muricata* and *Canavalia ensiformis*.

Jones 15-4: "breeds on the underside of yautía leaves, also . . . of sword bean (*Canavalia ensiformis*) and castor bean (*Ricinus communis*)."

Cotton 18-313: on yautía.

Smyth 20-124: "on an occasional cotton leaf . . . more injurious to castor-bean and lima bean."

on sword bean (204-12), at Pt. Cangrejos (GNW det. McAtee); on castor bean at Ciales (783-13), at Luquillo (96-16); on yautía at Mameyes (810-12); on lima beans at Guayama (664-17); scarce on cotton at Camuy (222-21).

**Corythaica carinata** Uhler—det. Carl J. Drake.

at San Juan, July 9-12, 1914. (record by Dr. Drake).

**Corythaica monacha** Stal—det. Heidemann

Van Zwaluwenburg 16-43: "very common on the under-leaf surface and on the topmost leaves of eggplant."

Jones 15-4: "all the foliage of eggplant withered . . . *Solanum torvum* also often attacked."

Cotton 18-297: "small, flask-shaped eggs in the tissue of the leaves . . . small wingless nymphs . . . attain adult form in

about ten days after hatching. Controlled with soap and water spray."

Cotton, R. T., "The Eggplant Lace-Bug in Porto Rico" in Jour. Dept. Agr. P. R., Vol. 1, No. 3, July 1917, pp. 170-173: life history, descriptions of stages, natural enemies and control.

on eggplant (533-12, 147-20), on *Solanum torvum* (359-12, 529-16), at Cayey (250-21), at Fajardo (469-12); on tobacco at Juncos (152-16).

**Monanthia monotropidia** Stal—det. McAtee

nymphs and adults abundant on underside of leaves of small unidentified tree in mountains north of Yauco (266-22).

**Teleonemia sacchari** Fabricius

AMNH at San Juan.

(750-14), on *Verbesina* flower (509-16).

**Leptodictya bambusae** Drake, Carl, in Ohio Jour. Science, Vol. 18, No. 5, March 1918, p. 175, TYPE from Mayagüez, Porto Rico: on bamboo.

LYGÆIDÆ.

**Blissus leucopterus** Say

AMNH at San Juan.

(695-17), on discarded cane stalks (714-12 det. Gibson); on injured cane shoots at Manatí and Vega Baja (nymphs—GNW); on sugar cane on Vieques Island (GNW); abundant and causing injury to roots of guinea grass at Hatillo (334-22); constituting 10% of the food of the lizzard, *Anolis pulchellus*, at Río Piedras (GNW).

**Ischnorhynchus championi** Distant

AMNH at Maricao.

**Ninus notabilis** Distant—det. McAtee

swept from grass (453-16).

**Oedancala cubana** Stal

Gundlach.

**Lygaeus bicrucis** Say—det. McAtee

at light (615-12, 299-16), at Guánica (643-13, most abundant Oct. 8), at La Plata (GBM); (has black prothorax margined with light yellow—probably another species) abundant and mating on *Conchorus hirsutus* at Pt. Cangrejos (70-16).

**Lygaeus collaris** Fabricius

Stahl.

**Lygaeus fasciatus** Dallas

Stahl. Gundlach.

**Nysius providus** Uhler

Uhler, "Hemiptera-Homoptera of Grenada, W. I." p. 182, 1894.  
(Van Z.)

**Nysius spurcus** Stal—det. Gibson

swept from weeds (349-17, 420-17); all stages common on  
*Hyptis pectinata* (749-14).

**Oncopeltus aulicus** Fabricius

Van Z. (det. Heidemann).

AMNH at Arecibo.

on milkweed, *Asclepias curassavica*, at Pt. Cangrejos (288-22), at Comerío (759-13), at Vega Baja (517-16), at Vega Alta (50-17, 172-15).

**Ozophora pallescens** Distant—det. McAtee

at light (251-16).

**Clerada apicicornis** Signoret

Gundlach, "se encuentra en toda la isla."

**Orthaea bilobata** Say

(as *Pamera*) Van Z. (P. R. 717).

AMNH at Coamo.

swept from weeds (409-17), at Pt. Cangrejos (GNW); all stages on *Piriqueta cistoides* (870-14), feeding on seed capsules of *Portulaca oleracea* (523-16); on cotton at Isabela (158-21).

**Orthaea vincta** Say

(as *Pamera*) Gundlach.

**Paromius longulus** Dallas

(as *Pamera*) Gundlach.

AMNH at Naguabo.

(855-14), on grapefruit tree at Vega Alta (171-15).

**Geocoris** sp.

Wetmore 16-66: eaten by Tody.

PYRRHOCORIDÆ. |

**Dysdercus andreae** Linnaeus The Common Cotton-Stainer or "Unión".

Van Z. (P. R. 716). AMNH at Coamo, Guayanilla, Tallaboa.

Smyth 20-123: "more frequently found in the drier --- sections, sometimes locally abundant, --- not a serious pest of cotton."

(as *D. suturellus* Herr. Sch.) Barrett 05-396: "caused considerable damage in a cotton field near Sabana Grande." May 06-11: mention.

at light at Guánica (406-14); on cotton at Isabela (208-21), at Boquerón (21-23). at Guánica (251-17), at Guayanilla (GNW — det. B. Uvarov, through Dr. Marshall).

**Dysdercus neglectus** Uhler—det. McAtee (*D. sanguinarius* Stal—det. H. G. Barber)  
on cotton at Quebradillas (186-22), at Vega Baja (295-22),  
at Algarrobo (194-22).

**Largus rufipennis** Castelnau  
Van Z. (P. R. 115).

**Largus varians** Stal—det. McAtee  
on coffee at Ciales (59-21, 258-22), at Lares (417-22); on  
Bromelid on *Erythrina glauca* at Cayey (352-22).

#### COREIDÆ.

**Corizus hyalinus** Fabricius—det. McAtee  
on weeds and tomato (237-16).

**Corizus sidae** Fabricius

Gundlach. Van Z. (933) on okra.

(as sp.) Wetmore 16-61: eaten by Ani.

swept from weeds (410-17), at Humacao (672-17 det. McAtee); common on *Amaranthus* flower heads (545-16); all stages abundant on *Waltheria americana* at Boquerón (17-23).

Eggs are cream colored, barrel-shaped and finely pitted, the pits in the circle around the lid being larger.

Just-hatched nymphs are oval, black or dark reddish-purple, with a large white oval latero-dorsal spot on each side of the first segment of the abdomen anteriorly, and four smaller and more median ones posteriorly.

Second instar nymphs have antennae, legs, head and thorax transparent pink, abdomen is black, the large white spots persistent, the others appear as lighter margins laterally of dark red median areas.

Larger nymphs have yellow antennae, pear-shaped yellow head with light reddish-brown eyes and a large dark-colored beak extending nearly to posterior end of the body. Thorax is narrower than the head, reddish-brown with extensive markings of greenish white, the legs are light yellow, incompletely or irregularly banded with dark red. Abdomen is round, flattened beneath, about twice as wide at the thorax, reddish-brown, irregularly banded with greenish-white and broken with large black warts. In the fully-grown nymphs, the antennae are darker, especially the terminal knobbed segment, head is lemon yellow with extensive darker areas, wing pads are yellow; the thorax and abdomen are red only at sutures, the greenish-white bands are more extensive, the black warts are conspicuous, the pointed tip of the scutellum in greenish-white and elevated.

**Serinetha coturnix** Burmeister

(as *Jadera sanguinolenta* Fabr.) Gundlach, with *Serinetha coturnix* Burm. in synonymy. "Creo que *coturnix* es un sinónimo y no otra especie."

(as *Pyrrhotes sanguinolenta* Fabr.) Van Z. (P. R. 118).

at light (405-12 det. McAtee), at Pt. Cangrejos (GNW), at Humacao (54-13), at Guánica in abundance (580-13, 1304-13).

**Leptocoris filiformis** Fabr.

Gundlach, "posible *L. tipuloides* DeGeer - - - sinónimo."

**Alydus (Megalotomus) pallescens** Stal

Gundlach. (as *A. rufipes* Westw.) AMNH at Arecibo.

swept from cowpeas (96-12), from weeds at Laguna San José (838-14 det. McAtee), at Algarrobo (769-14).

**Hyalmenus serratus** Fabricius

AMNH at Arecibo.

**Protenor tropicalis** Distant—det. McAtee

(one unlabeled specimen.)

**Schictyrtus whitei** Guerin

AMNH from Mona Island.

Van Z. (P. R. 701) from Mona Island.

common on Mona Island (1303-13).

**Zicca taeniola** Dallas

Gundlach. Van Z. (P. R. 116).

swept from weeds (417-17, 238-16): on curcurbits at Añasco (1033-13), abundant on seed-heads of *Amaranthus* at Guánica (566-16).

**Catorhintha guttula** Fabricius

AMNH at Aibonito and Coamo.

Wetmore 16-61: eaten by Ani.

swept from weeds at Humacao (671-17); abundant on sticky-capsule vine, *Commicarpus scandens*, at Aguirre (70-16); on sugar cane (presence probably accidental) at Yauco (239-21), at Añasco (GNW).

**Leptoglossus balteatus** Linnaeus

Gundlach. (as *Anisoscelis thoracicus* Guer.) Stahl.

**Leptoglossus gonagra** Fabricius

Gundlach. AMNH at San Juan.

(as *Anisoscelis*) Stahl.

Cotton 18-307, fig. 61: "This large brownish-black bug (was) found with its long needle-like proboscis inserted in the stems of the squash vine. It lays small, brown, barrel-shaped eggs

in a single row on the stems of the vine, (which) hatch into small bright-red and black nymphs - - - (which) pass through a number of forms and color changes before becoming adults."

on weeds in cane field (646-12, 748-12); on corn at Sabana Llana (127-15); on *Cleome spinosa* at Cayey (177-16).

**Leptoglossus stigma** Herbst

Gundlach. (as *Anisoscelis serrulatus* Herr. Sch.) Stahl.

**Leptoglossus zonatus** Dallas—det. Gibson

resting on *Psidium guajava* at Ciales (784-13).

**Phthia picta** Drury

Gundlach. Van Z. (det. Heidemann). AMNH at San Juan.

Jones 15-4, pl. 1, fig. 3: "Both adults and nymphs attack the fruit of tomato and *Solanum nigrum* var. *americanum*."

Cotton 18-311: "The bright-red wingless nymphs congregate in groups on developing (tomato) fruit and distort it with their punctures."

on tomato (748-14, 185-16, 447-16, 542-16), on *Solanum nigrum* var. *americanum* (716-14, 328-16, 521-16, 542-16, 563-16, 84-20), on weeds (239-12, 386-12, 489-12, 418-17), on *Physalis* (521-16); on cucurbits at Añasco (1032-13).

**Phthia lunata** Fabricius

Gundlach. (as *Leptoscelis*) Stahl.

**Chariesterus moestus** Burmeister

Van Z. (det. Heidemann). (as *Corestus*) Stahl.

from weeds (387-12, 581-12), at Humacao (670-17 det. McAtee); from cucurbits at Añasco (1034-13); from *Amaranthus* at Yauco (385-21) at Toa Alta (GNW).

**Chariesterus gracilicornis** Stål

Gundlach.

**Sephina indierae** sp. nov.

Antennae, eyes, base of beak, legs, anterior and lateral margins and large postmedian spot on disc of prothorax, scutellum, median and apical areas of basal half of forewing and all membrane, the posterior angles of the abdominal segments, black. Head, ocelli, narrow semicircle on disc of prothorax, base and anteapical areas of basal half of forewings, crimson; portions of the thorax and abdomen darker red varying to black with large, margined, lighter-colored spiracular openings. Except for membrane of the wing, entirely covered with abundant short black hairs, especially abundant and long on prothorax above, giving a coarse velvety appearance. Antennae inserted on callosities in front of the small eyes, nearly as long as the body, 1st and 2nd, and 3rd and 4th segments approximately equal in length, all subequal. Prothorax much



broader behind than in front, sharply depressed anteriorly to a deep and broad submarginal transverse furrow, with a short medio-dorsal longitudinal furrow extending upward to the more or less flattened area between the lateral angles. Length 20 mm. width at angles of thorax, 6.5 to 8.5 mm.

described from eight adults, all in coitu, on parasitic vine, *Metastelma* sp., in deserted coffee grove, region locally known as "La Yndiera", in mountains north of Yauco (147-June 16, 1921), Seín & Wolcott collectors, generic determination by Mr. McAtee.

### **Spartocera batatas Fabricius**

Van Z. (922) on sweet potato leaves. AMNH at San Juan.

Jones 15-4, pl. 1, fig. 2: "Adults and nymphs - in great abundance on sweet potato, their beaks imbedded in the stalks and leaf petioles."

(as *S. fusca* Thunbg.) Gundlach. Busck 00-90; Cotton 18-310: notes.

Wetmore 16-61, 98: eaten by Ani and Jamaican Vireo.

on sweet potato (109-18), at Carolina (11-19), at Naguabo (47-14 det. Heidemann), at Hatillo (121-18); all stages abundant on eggplant (446-16, 508-16), on *Solanum nigrum* var. *americanum* (541-16), at Fajardo (464-12), at Guayama (71-21); adults on sugar cane (accidental) at Barceloneta (63-11); clusters of golden eggs abundant on bark of *Erythrina glauca* trees at Cayey (326-17), on posts (47-15, 137-16); control by dusting with Calcium Cyanide (F. Seín).

### PENTATOMIDÆ.

#### **(Pentatoma tincta Dahlb.**

Stahl.)

#### **Arvelius albopunctatus DeGeer**

Gundlach. Van Z. (935) on tomato and *Solanum torvum*.

AMNH at Mayagüez.

Cotton 18-312: "on tomato."

(as *Pentatoma*) Stahl.

on tomato (187-16), at Hatillo (119-18); on fruit of *Solanum torvum* at Mameyes (380-22), at Barranquitas (402-22).

#### **Edessa bifida Say**

Gundlach. AMNH at Arecibo.

(as *Aceratodes cornuta* Burm.) Stahl.

(as *E. cornuta* Burm.) Van Z. (P. R. 119).

(as sp.) Wetmore 16-61: eaten by Ani.

on sugar cane (accidental) (90-19), on weeds (136-12, 631-12, 738-12, 412-17), on morning-glory, *Ipomoea rubra*, nymphs and adults feeding on terminal shoots and tender stems (287-16, 291-16, 322-16, 611-16, 685-16, 63-20, 85-20); at Naguabo (728-14 det. as *E. cornuta* Burm. by Mr. Gibson); at Hatillo (120-18); on *Cassia* sp. at Sabana Llana (446-19).

**Edessa** sp. (not *affinis* Dallas—compared with type in British Museum).

(as *Edessa affinis* Dallas—det. McAtee) Wolcott 23-46: on coffee. Wolcott 22a-5: illustration of adult.

(as *E. vinula* Stal) AMNH at Aibonito.

on coffee at Jajome Alto (369-21), at Aibonito (236-21), at Ciales (466-21, 80-22), at Corozal (457-21), at Utuado (478-21), at Lares (144-20, 322-21, 390-21, 110-22), at Maricao (81-22), in the mountains north of Yauco (145-21, 114-22, 235-22); nymphs and adults on *Solanum torvum* in the mountains north of Yauco (262-22).

**Euschistus bifibulus** Palisot de Beauvois—det. Heidemann  
Van Z. (P. R. 709).

Cotton 18-280 and 312: on beans and on tomato.

on weeds (61-12, 388-12, 416-17), on *Gynandropsis pentaphylla* (501-12), on tomato (184-16), on beans (199-16, 342-17), on *Solanum nigrum* (296-16, 482-16, 520-16, 600-16), on *Physalis angulata* (520-16, 600-16), on asparagus fern (87-19); on grapefruit foliage at Vega Alta (101-17); on cucurbits at Guánica (1030-13).

**Euschistus crenator** Fabricius

AMNH at Coamo.

(534-14)

**Loxa flavicollis** Drury

Gundlach. Van Z. (P. R. 720).

at light (238-12), at Carolina (1045-16).

**Loxa** sp.—det. McAtee

on cotton at Pt. Cangrejos (551-22).

**Mormidea ypsilon** Linnaeus—det. McAtee

on grass in pasture at Guaynabo (724-17).

**Nezara (Acrosternum) marginata** Palisot de Beauvois

(Orifice of osteolar canal "long and curved, becoming gradually evanescent, extends almost to the posterior lateral angle of the metapleura." Jones.)

Gundlach. Van Z. (P. R. 113). AMNH at Tallaboa.

(as *N. viridula* Linn.) Cotton 18-312: "on tomato".

on tomato (186-16, 348-17); on tobacco at Juncos (154-16); at light at Guánica (1071-13).

**Nezara viridula** Linnaeus

(Orifice of osteolar canal with raised margin, most prominent towards the apex, where it is sharply truncated, "and does not extend more than half way to the lateral margin of the metapleura." Jones.)

(as *Pentatoma smaragdula* Fabr.) Stahl.

(as sp.) Wetmore 16-61, 77, 80, 82, 98: eaten by Ani, Kingbird, Petchary, Flycatcher and Jamaican Vireo.

Van Z. (P. R. 704). AMNH at Tallaboa.

on cowpeas (91-12), on beans (785-14), on *Cleome spinosa* (500-12); at Añasco (1031-13); on sugar cane (accidental) at Humacao (53-13); on coffee at Lares (311-21); on tobacco at San Lorenzo and reported as causing damage (11-21); on Vieques Island (GNW); on Mona Island (1319-13).

### **Piezodorus guildingi** Westwood

Cotton 18-280: on beans. AMNH at Arecibo.

on cowpeas (72-12, 177-12 det. Gibson), on beans (786-14, 159-16, 198-16, 564-16), on *Chamaecrista deschynomene* (619-16, 707-16); at light at Guánica (1072-13); on Vieques Island (GNW).

### **Piezosternum subulatum** Thunberg—det. Gibson

Nymphs are bright yellow, becoming orange on abdomen; wing-pads, scutellum, prothorax laterally and outer portions of abdominal segments posteriorly broadly margined with black, also antennae and eyes are black, besides bands extending to the sides of the scutellum, joined in the middle of the prothorax with the marginal bands, and a median band on head, narrowly divided on prothorax, more widely on scutellum, and as a series of crescents on the abdomen.

Adults yellow and dark green, scutellum with a median ridge, greatly extended and sharply pointed posteriorly.

all stages on *Passiflora* sp. (937-13); on coffee at Lares (292-21), at Ciales (217-22).

### **Proxys victor** Fabricius

Van Z. (P. R. 117). (as sp.) Wetmore 16-61: eaten by Ani.

on cucurbits at Añasco (1029-13); on grapefruit at Vega Baja (491-16); on squash vine in grapefruit grove at Vega Alta (224-17); on weed at Guayama (70-21).

### **Proxys punctulatus** Palisot de Beauvois

Gundlach.

(as *Pentatoma* (*Priononyx*) *punctata* Pal. de B.) Stahl.

### **Solubea pugnax** Fabricius

(as *Pentatoma* (*Mormidea*) *typhaeus* Fabr.) Stahl.

(as *Oebalus*) Gundlach.

### **Thyanta antiguensis** Westwood

Van Z. (P. R. 718).

(as sp.) Wetmore 16-61, 75, 82, 89, 91, 93, 96: eaten by Ani, Black Swift, Flycatcher, Martin, Mockingbird, Thrush and Latimer's Vireo.

on beans (568-16); on weeds (411-17), at Guánica (503½-13, 1107-13); abundant on rice at Canóvanas (190-16).

**Thyanta perditor** Fabricius(as *Mormidea*) Stahl.

Gundlach. Van Z. (P. R. 705). AMNH at Mayagüez.

Wetmore 16-58, 61, 89: eaten by Mangrove Cuckoo, Ani and Martin.

on weeds (341-17), at Carolina (RTC), at Añasco (1109-13), at Vega Baja (510-16); on *Cleome spinosa* at Cayey (188-16); all stages abundant on *Piriqueta cistoides* Mey. (831-14 det. Gibson).**Podisus sagitta** Fabricius

Gundlach.

(832-14), at Aibonito (SSC — det. McAtee); resting on cotton at Boquerón (35-23).

**Podisus sculptus** Champion—det. McAtee

on coffee leaves (726-17).

**Mutya grandis** Dallas

Van Z. (det. Heidemann).

(one unlabeled specimen — det. McAtee.)

**Mutya phymatophora** Palisot de Beauvois

Gundlach. Van Z. (P. R. 710).

**Pharypia pulchella** Drury

Van Z. (P. R. 112).

## SCUTELLERIDÆ.

**Pachycoris torridus** Scop.—det. Gibson

Smyth, E. G., "Un Insecto Extraño que Cubre su Cría lo Mismo que una Gallina" Rev. Agr. P. R., Vol. 2, No. 4, March 1919, pp. 27-31, pl. 2: (an extraordinary insect which broods her young like a hen).

First instar nymphs are bright red, in following instars metallic green with orange-red dots; adults velvety blue-black with orange-red spots, the four largest on the abdomen often coalescing and in a few individuals extending over nearly the entire abdomen.

on *Croton discolor* and *Lantana involucrata* at Ponce (112-13); on *Croton humilis* at Guánica (135-15), and on this and other species of wild *Croton* at Moca (708-14), Aguadilla (229-22), Hatillo (507-18).**Pachycoris fabricii** Palisot de Beauvois(as *Scutellera nitens* Dallas) Stahl.

Gundlach.

**Sphyrocoris obliquus** Germar

Gundlach.

**Augocoris pallidus** Herrich-Schaeffer

(as *Scutellera cretacea* Voet.) Stahl.

Gundlach.

on *Phyllanthus epiphyllanthus* at Bayamón (740-13 det. Gibson).

**Diolcus boscii** Fabr.—det. H. G. Barber

at Yauco (706-14, 837A-14).

**Diolcus irroratus** Fabricius—det. McAtee

flying in grapefruit grove at Pueblo Viejo (457-16); at Pt. Cangrejos (GNW).

**(Mesotrypa sinuosa** Uhler MS

Gundlach.)

CYDNIDÆ.

**Amnestus pusillus** Uhler

Gundlach, "vuela a menudo hacia las luces encendidas en las casas."

**Rhytidiporus indentatus** Uhler—det. McAtee

at light (681-17), at Manatí (597-16).

THYREOCORIDÆ.

**Thyreocoris (Corimelaena) minutus** Uhler

AMNH at Ponce.

on the ground among weeds at Pt. Cangrejos (GNW det. McAtee).

HOMOPTERA.

CICADIDÆ.

**Proarna hilaris** Germar

(as *Odopoea* sp.) Van Z. (P. R. 719).

Wetmore 16-57, 59, 63, 69, 77, 80, 82, 96, 98, 106, 114, 116, 119: eaten by Mangrove Cuckoo, Ground Cuckoo (4.16% of food), Woodpecker, Owl, Petchary (2.47% of food), Flycatcher, Kingbird, Vireos, Yellow Warbler, Yellow-Shouldered Blackbird, Oriole and Mozambique.

at light (436-12 det. Gibson, 692-12, 124-18), at Condado (66-11, 159-15), at Martin Peña (89-16, 262-16), at Vega Alta (160-15), at Guánica (407-14, 1136-13 det. McAtee); resting on sea-grape at Quebradillas (300-21); on grapefruit at Pt. Salinas (125-15, 179-15); nymphs in sandy soil at Mameyes (819-12), apparently feeding on roots of *Wedelia trilobata* at Pt. Salinas (GNW).

**Zammara** sp.—det. McAtee

(as *Proarno* sp.) Wetmore. 16-77, 82: eaten by Kingbird and Flycatcher.

at light at Aibonito (1305-13); on coffee tree at Lares (481-

21), at Corozal (279-21), in mountains north of Yauco (247-22); nymphs from soil about roots of coffee trees at Añasco (375-12), of other trees (374-12).

## MEMBRACIDÆ.

**Antianthe expansa** Germar—det. Funkhouser

Smyth 20-125: on cotton. Wolcott 23-46: on coffee.

Wolcott 23-46: on coffee.

on tomato (179-16), on *Spondias lutea* (724-16), on *Psidium guajava* (1119-16), on *Cissus sicyoides* (430-21), on mulberry (131-22); on grapefruit (178-16, 550-16, 330-17), at Vega Baja (553-16), at Vega Alta (228-17); on tobacco at Cayey (38-16); on wild Bougainvillea vine at Cayey (354-22); on *Solanum torvum* at Ciales (223-22), at Bayamón (508-17); on coffee at Corozal (283-21), at Ciales (465-21), at Utuado (477-21); on ganduli, *Cajanus cajan*, at Comerío

**Monobelus fasciatus** Fabricius—det. Funkhouser

Wolcott 23-46: on coffee.

on *Spondias lutea* (782-16), on *Erythrina glauca* (785-13, 964-16); on *Solanum nigrum* at Vega Baja (532-16); on *Inga laurina* at Lares (638-21, 149-22); on ganduli, *Cajanus cajan*, at Comerío (763-13, 769-13).

## CERCOPIDÆ.

**Epicranion championi** Fowler

Van Z. (608) on coffee and *Inga laurina*.

Van Zwaluwenburg 17-516: "fairly common (on coffee); spittle masses around a berry cluster often contain as many as six nymphs."

on coffee at Lares (129-21); nymphs common on coffee throughout the coffee districts.

**Philaenus fusco-varius** Stal—det. McAtee

on weeds (734-17), on mulberry (131-22).

## CICADELLIDÆ (JASSIDÆ).

**Agallia tenella** Ball (possibly *A. albidula* Uhler—det. DeLong)

Barrett 04-448; Howard 04-88: injurious to beans, cowpeas and other plants.

Jones 15-2 and 3: correctly quotes other records.

Wolcott 21-19, fig. 5: on sugar cane, in abundance at Garrochales; on *Solanum torvum* and potatoes. Illustration of adult.

on carrots (539-17, 531-17, 686-17), on string beans (206-16), on *Agati grandiflora* (155-21), on weeds (431-17), on grass (450-16, 452-16), on eggplant (448-16); on tobacco (1151-16), at Juncos (157-16); on potatoes at Jajome Alto (21-21); on tobacco at Cayey (21-21); on cotton at Camuy (227-21). All stages on tobacco (591-16).



**Agallia pepino** sp. nov. DeLong & Wolcott

Bluish-white. Length 2.5 mm. Eyes dark brown with creamy margins. Vertex only slightly broader behind the eyes, with lenticular median piceous spot, and a pair of round piceous spots near the anterior angle of the eyes extending on to the front and an irregular-shaped pair on the posterior margin between the others. Large yellow ocelli ringed with piceous and an inverted Y with arms extending towards bases of the antennae. Anterior margin of pronotum light chestnut, becoming broader and piceous laterally behind the eyes; a pair of large, pear-shaped dull-yellow areas with irregular piceous margins posteriorly; a lenticular piceous median spot and indistinct brownish spots near lateral angles. Scutellum with a pair of piceous spots and the broadened ends of the piceous depression partly under the pronotum. Elytra dull brown, semi-transparent, venation dull bluish-white; a bright bluish-white semicircle connecting the inner and outer sectors of the clavus with the median inner margin.

Genitalia: *Female* last ventral segment rather narrow, one-half longer than preceeding segment. Posterior margin rather broadly notched one-fourth the distance to base so as to form two rather broadly rounded lobes. *Male* valve short and broad, convexly rounding. Plates long and narrow, rather broad at base, abruptly constricted before their middle and produced into long narrow acute tips.

from carpet grass, *Axonopus compressus*, at Ciales (64-21 TYPE); on sugar cane at San Sebastián (GNW).

**Agallia carotovora** sp. nov. DeLong & Wolcott

Resembling *A. sanguinolenta* Provancher. Dull yellow. Length 3 mm. Vertex of uniform length, with a pair of large oval piceous spots on posterior margin, two closely proximate median lines forming the lower arm of an inverted Y on the front, below which a double series of somewhat irregular transverse black spots extend to black-based clypeus, and in front of eyes an irregular band, with arms extending around the ocelli. Pronotum, differing from *A. sanguinolenta*, thickly dotted with piceous depressions, except at lateral angles, and solidly piceous along median line and in acute triangles on lateral margins surrounding a lenticular clear space behind the eyes. Scutellum black with a large yellow V bordering posterior margins and a pair of dull yellow spots partly under the pronotum. Elytra light brown with dark brown venation, except light yellow areas near base of corium, basal half of sectors of clavus, spots at their margins and a triangle next to the scutellum.

Genitalia: *Female* last ventral segment more than twice as long as preceeding. Lateral angles strongly produced, posterior margin concavely excavated half way to base, median third broadly bordered with brown. *Male* valve short, round-

ingly produced. Plates three times as long as last ventral segment, rather broad at base, outer margins scarcely narrowed to near apex where they are strongly convexly rounded to appressed apices.

from carrots, R. T. Cotton, collector (686-17 TYPE).

***Agallia pulchra* sp. nov.** DeLong & Wolcott

Light yellow. Length 3-3.5 mm. Vertex cadmium yellow, longest near sides because of dark protruding eyes; a pair of transverse black dots on or near posterior margin making it appear angled; a pair of much larger black spots in front of eyes, a smaller median spot on anterior margin and usually another median one on front. Pronotum bright orange, fading to canary yellow on posterior margin, with black anterior margin, and median line extending between a pair of large black spots, often coalesced with margin broadened behind eyes. Scutellum yellow with black depression and a pair of black spots anteriorly. Elytra black, but with venation broadly outlined in greenish-yellow on clavus, lighter on corium, almost obliterating the black near the outer margin, and entirely so between distal portions of sections of the clavus.

Genitalia: *Female* last ventral segment longer than preceding, lateral angles produced, posterior margin concavely excavated with a narrow median incision at middle. *Male* valve short, almost concealed under last ventral segment, apex bluntly rounded. Plates rather broad at base, three times as long as last ventral segment, gradually narrowed to rather blunt tips.

from carrots (686-17); from sugar cane at Guánica (138-21); from *Inga laurina* at Lares (164-22 TYPE); from coffee at Lares (393-21), at Utuado (476-21), from mountains north of Yauco (305-21, 85-22).

***Tettigonia occatoria* Say**

Van Z. (627) on coffee and *Inga laurina*.

Wetmore 16-66: eaten by Tody, *Todus mexicanus*.

Wolcott 21-20: on sugar cane at Morovis.

common on tender stems of coffee (47-21, 82-21 det. McAtee, as identified by Fowler in Biol. Cent. Amer., 266-21), at Adjuntas (487-21), in mountains north of Yauco (87-22), throughout the coffee growing region (289-21); on orange at Jajome Alto (22-21); on *Solanum torvum*, *Heckeria pellata*, *Phytolacca decandra* and coffee in mountains north of Yauco (234-22); on stems of fresa, *Rubus rosaeifolius*, at Adjuntas (47-23); nymphs on *Heckeria pellata* at Vega Alta (106-21).

***Tettigonia sirena* Stal**

Smyth 19-145: on "sugar cane, citrus, coffee, sesame, garden plants.

Wolcott 21-20, fig. 6: on gramma grass. *Stenotaphrum secundatum*.

tum, and Bougainvillea vine at Pt. Cangrejos; on sugar cane at many points.

Tower 22-24: unsuccessfully used in transmission of mosaic disease of sugar cane experiments.

on malojillo grass, *Panicum barbinode*, (439-16, 519-17), on weeds (430-17), on *Urena lobata* (150-17), on sesame (771-11), on carrots (574-17, 529-17), on *Agati grandiflora* (156-21); on grapefruit at Vega Baja (534-16); on ganduli, *Cajanus cajan*, at Comerío (760-13 det. Heidemann, 770-13); on coffee at Lares (290-21), at Ciales (224-22); on weeds at Bayamón (509-17); on sugar cane at Hormigueros (35-22), at Bayamón, Barceloneta, Córscica, Adjuntas and Guánica (GNW).

### **Kolla fasciata** Walker

(as *K. fuscolineella* Fowler) Wolcott 21-22, fig. 7: on St. Augustine, Bermuda and carpet grass, on sugar cane and malojillo grass, commonest in the hills. Illustration of adult.

on carpet grass in coffee grove at Ciales (63-21); on sugar cane at Toa Alta (450-21), at Corozal (GNW — det. as *Tettigonia arculifera* by Mr. Gibson), at Río Piedras and Coloso (GNW).

### **Kolla similis** Walker

(as *Tettigonia*) Van Dine 11-31; Van Dine 12-22; Van Dine 13-257: on sugar cane.

Smyth 18-118; Smyth 19-145: on malojillo grass and young sugar cane.

Smyth 19-99; Tower 22-24; Wolcott 23-45: unsuccessfully used in mosaic disease of sugar cane transmission experiments.

Wolcott 21-22 to 28, fig. 8: the most extended account; life history and abundance as affected by size of cane, contour of field, and rainfall. Illustration of adult and nymph.

Chardón 23-64 to 67: abundance in fields of young cane where mosaic disease is spreading.

on sugar cane (218-13, 286-19), at Naguabo (35-10 det. Heidemann as *Tettigonia*), at Fortuna (54-10), at Hormigueros (36-22), at Toa Alta (453-21); on grass in coffee grove at Ciales (62-21); on weeds (429-17, 516-17), on corn (447-17), on carrots (530-17), on beans (202-16). Nymphs on sugar cane (164-19, 221-19), eggs in leaves of sugar cane (319-12, 287-19), parasitized by *Brachistella prima* Perkins, *Ufens niger* Ashmead and *Oligosita comosipennis* Girault (335-12 det. Girault).

### **Draeculacephala sagittifera** Uhler—det. Metcalf

Wolcott 21-28, fig. 10: on sugar cane, not abundant.

on sugar cane at Hormigueros (33-22), at Guánica (139-21); nymphs and adults common on Bermuda grass (260-21), at Aguada (GNW).

**Xerophloea viridis** Fabricius—det. McAtee

common on carrots (528-17, 684-17); on grass at Aguadilla (232-22); at light at Yauco (304-21).

**Xestocephalus pulicarius** Van Duzee—det. Metcalf

on coffee (78-21), at Lares (392-21); at light at Pt. Cangrejos (GNW).

**Spangbergiella vulnerata** Uhler

Wolcott 21-29: from sugar cane and malojillo grass, rare. swept from weeds (432-17), at light (GNW).

**Scaphoideus fasciatus** Osborn—det. Ball

Wolcott 21-31: on sugar cane at Bayamón, at light at Pt. Cangrejos.

at light (329-21).

(See page 262.)

**Scaphoideus bimarginatus** sp. nov. DeLong

Resembling *auroniteus* Provancher in general appearance, but with two parallel bands above, and one beneath the ocelli. Length 4 mm.

Vertex very bluntly angled, a little wider between the eyes than length at middle. Pronotum longer than vertex, twice wider than long. Elytra little longer than abdomen.

Color: Vertex dull golden yellow, a curved band just above ocelli and parallel to anterior margin, a second one just posterior to it and as far distant as the width of the first, the space between silvery white. Pronotum and scutellum golden yellow, mottled with brown. Elytra pale brownish, subhyaline, veins and a few small areas dull brown. Face with a heavy black band just below ocelli, a narrow pale band beneath it, the remainder of the face pale brown shading to yellow on clypeus with no indication of areae. Beneath yellow, marked with brown.

Genitalia: *Female* last ventral segment about twice as long as preceding, lateral margins short, gradually produced to form a broad, short median tooth.

described from one female collected at light at Pt. Cangrejos, Feb. 27, 1920 (GNW).

**Platymetopus** sp.

on string beans (207-16).

**Daltocephalus flavicosta** Stal—det. DeLong

(as *D. contestus* Uhler MS) Gundlach.

(as *D. senilis* Uhler—det. Metcalf) Wolcott 21-29, fig. 11: on sugar cane and malojillo grass.

at light (569-17), on carrots (541-17, 538-17, 685-17); on sugar cane at Hormigueros (34-22).

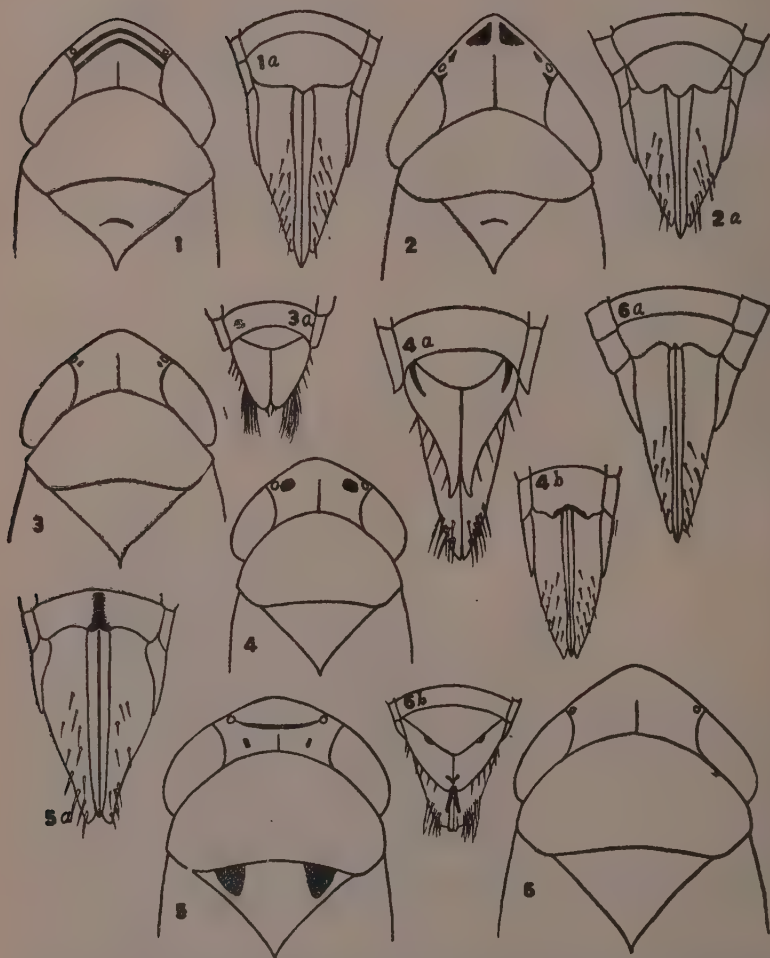


PLATE 1.—1. *Scaphoideus bimarginatus*: 1 a, female genitalia. 2. *Deltoccephalus trilobatus*: 2 a, female genitalia. 3. *Deltoccephalus nigripennis*: 3 a, male genitalia. 4. *Cicadula maidis*: 4 a, male genitalia; 4 b, female genitalia. 5. *Chlorotettix nigromaculatus*: 5 a, female genitalia. 6. *Chlorotettix bidentatus*: 6 a, female genitalia; 6 b, male genitalia. (Original. Drawn by D. L. DeLong.)

**Deltocephalus sonorus** Ball—det. DeLong  
on malojillo grass at Pt. Cangrejos (GNW).

**Deltocephalus trilobatus** sp. nov. DeLong

Resembling *D. micarius* Ball in form, size and coloration. Vertex more produced and genitalia distinct. Length 2.5 mm.

Vertex distinctly angled, a little longer on middle than between eyes. Pronotum shorter than vertex, twice wider than long. Elytra with clavus reticulate; central anteapical cell constricted and divided.

Color: Vertex dull yellow with a pair of orange triangular spots at apex and two small brownish spots just above either ocellus. Median impressed line brown. A darker longitudinal area extends back on either side, crossing pronotum and terminating on basal angles of scutellum. Two other longitudinal stripes on pronotum lateral of the central pair. Elytra dull yellow, veins more or less heavily infuscated. Face brownish with traces of pale ares. Beneath, yellow marked with brown.

Genitalia: *Female* last ventral segment about as long as preceding; side margins very short, lateral angles produced and rounded, between which, the posterior margin gradually slopes to a slight emargination on either side of a rounded, rather broad, but short median tooth which scarcely exceeds lateral angles in length. Underlying membranes conspicuous at either side.

described from a single female at light at Pt. Cangrejos, Dec. 16, 1919 (GNW).

**Deltocephalus nigripennis** sp. nov. DeLong

In general appearance somewhat resembling the *nigrifrons* group, but with coloration and genitalia distinct. Length 4 mm.

Vertex roundly produced, more than one-fourth wider between eyes than length at middle. Pronotum one-fourth longer than vertex and almost twice as wide as long. Elytra with central anteapical cell produced anteriorly and posteriorly beyond inner and outer anteapicals, and very much longer than outer cell.

Color: Vertex, pronotum and scutellum bright green tinged with yellow, a small black area on lateral margins on pronotum. Elytra, whitish, subhyaline, almost covered with black; a broad stripe along claval and commissural line to tip of clavus and a transverse band just before tip of clavus whitish, remainder black. Face black with only a few traces of pale ares. Venter black, lateral margins yellow.

Genitalia: *Male* valve two-thirds as long as preceding segment, rather broad, convexly rounded. Plates together at base one-fourth wider than long, gradually sloping to blunt, rather



broadly rounded apices. Tips with tufts of whitish pubescence.

described from one male swept from grass at Boquerón (98-Feb. 21, 1923 GNW).

**Euscelis (Athysanus) striolus** Fallen—det. DeLong  
on malojillo grass at Pt. Cangrejos (GNW).

**Athysanus exitiosus** Uhler—det. Ball  
Wolcott 21 30, fig. 12: on sugar cane at Patillas and Hatillo, rare.

**Acinopterus acuminatus** Van Duzee—det. DeLong  
swept from grass at Boquerón (99-23).

**Thamnotettix colonus** Uhler—det. Metcalf  
Wolcott 21-30, fig. 13: on sugar cane and malojillo grass, but commonest on carpet grass, *Axonopus compressus*, in the hills. (as *Tettigonia similis* Walker—a misidentification) Johnston 15-23: killed by *Empusa muscae* (provisional determination). on sugar cane (654-12), on grass (451-16), on tobacco (1153-16).

**Thamnotettix nigrifrons** Forbes—det. GNW  
on carrots (532-17).

**Thamnotettix comatus** Ball (?)—det. DeLong  
Two large and four small black spots on vertex.  
on carrots (532-17).

**Chlorotettix viridius** Van Duzee—det. DeLong  
at light at Pt. Cangrejos (GNW).

**Chlorotettix bidentatus** sp. nov. DeLong  
Resembling *minimus* Baker in size and form, but genitalia are distinct. Length 3.5—4 mm.

Vertex bluntly angled, about one-fourth longer on middle than next eyes and almost twice as wide between eyes as length at middle. Pronotum not quite twice as long as vertex.

Color: Dull yellowish-green, unmarked.

Genitalia: *Female* last ventral segment about as long as preceding, lateral angles produced and rounding, posterior margin shallowly excavated to a short, broadly-rounded median tooth, notched at apex. Whole tooth broadly embrowned. *Male* valve roundly produced, bluntly angled, more than twice as long as preceding segment and almost twice as broad as long. Plates exceeding valve by one-third its length, strongly convexly rounded to rather appressed blunt apices, greatly exceeded by pygofer.

described from two females and one male, at light at Pt. Cangrejos, Dec. 16, 1919, Feb. 8 and 26, 1920, and one female

on sugar cane at Guánica, Dec. 10, 1919 (GNW). TYPE specimen is a female.

(as sp.) Wolcott 21-31, fig. 15: on sugar cane at many places, and at light at Pt. Cangrejos.

on weeds (567-16), at Humacao (689-17); on sweet potato (201-17).

**Chlorotettix** sp. nov. (undescribed)

Wolcott 21-32, fig. 16: on sugar cane at Guánica and Patillas; at light at Pt. Cangrejos.

**Chlorotettix nigromaculatus** sp. nov. DeLong & Wolcott

One of the round-headed species, yellowish-green with brown markings. Length 4.5 mm.

Vertex well rounded in front, slightly longer on middle than next eyes and almost twice as wide between eyes as length at middle. Pronotum twice as long as vertex and almost twice as long. Elytra rather long, appearing wedge-shaped when folded.

Color: Vertex yellowish-green, ocelli large, reddish, a transverse brown band just above them not reaching eyes. A pair of large round black spots on rounded margin just below ocelli. Face yellowish with slight traces of arcs. Pronotum yellowish, unmarked. Scutellum with a large subtriangular dark brown spot in each basal angle extending under the pronotum. Elytra whitish, hyaline, nervules milky white, two oblique brown stripes on inner clavus between veins and a broader one between claval vein and corium. Some of the cells of corium yellowish.

Genitalia: *Female* last ventral segment one-half longer than preceding, lateral angles produced, posterior margin shallowly concavely rounded and slightly notched at middle. A median brown stripe extends to base of segment.

described from a single female at light at Río Piedras (326-Oct. 10, 1922 GNW).

**Jassus obligatus** Uhler—det. McAtee

on leaves of *Ficus laevigata* at Quebradillas (221-21).

**Cicadula sexnotata** Fallen

Wolcott 21-31: on sugar cane at Patillas and Garrochales.

**Cicadula maidis** sp. nov. DeLong & Wolcott

In coloration resembling a very pale *variata* Fallen, elytra long, resembling *Thamnottettix fitchii* Van Duzee, but with typical *Cicadula* veination. Length 3.5—4 mm.

Vertex roundingly produced, thick, about one-third wider between eyes than length at middle; pronotum one-half longer than vertex, very strongly convexly rounded anteriorly; elytra long, greatly exceeding abdomen in both sexes.

Color: Straw yellow, vertex with a pair of large round

black spots, one just behind each ocellus; frequently a small spot at tip of vertex, median impressed line and four spots at base a darker yellow. Pronotum with an indication of longitudinal vittae. Basal angles of scutellum a darker yellow. Elytra yellowish, subhyaline, veins lighter.

Genitalia: *Female* last ventral segment longer than preceding, posterior margin slightly produced on either side of a broad, rather shallow, median V-shaped notch, which is slightly embrowned. *Male* valve as long as preceding segment, convexly rounded. Plates exceeding valve by more than twice its length, broad at base, concavely narrowed at half their length to form narrow, rather sharp-pointed apices. A brown mark near outer margin of either plate at base. Pygoferes exceeding plates.

adults and nymphs abundant on corn (448-17 TYPE), at San Sebastián (102-21), (at Haina, Santo Domingo, August 1920, GNW); on sugar cane (645-12), on carrots (540-17). Corn the normal and common host.

**Eugnathodus bisinuatus** sp. nov. DeLong

In coloration resembling *Balclutha osborni* Van Duzee, but with vertex as wide or wider than pronotum and with distinct genitalia. Length 3—3.5 mm.

Vertex broadly rounded, almost parallel margined, three and one-half times as wide between eyes as length at middle. Pronotum more than three times as long as vertex. Elytra long, greatly exceeding abdomen.

Color: Bright green without definite markings. Eyes dark; elytra greenish, subhyaline. Beneath yellow to bright green.

Genitalia: *Female* last ventral segment about as long as preceding, posterior margin bisinuate, forming three rather distinct lobes. A brown line indicates a more distinct trilobate condition, which is apparently covered posteriorly by a thin membranous portion. *Male* valve triangular, tip blunt or truncate. Plates exceeding valve by one and one-half times its length, short and broad, broadly rounded at apex. A rather long narrow process extends dorsally from the dorsal surface of each plate.

described from a large series of specimens from seed heads of malojillo grass, *Panicum barbinode*, at Río Piedras, March 2, 1923 (GNW).

(as *Balclutha* sp. (*Gnathodus*) in part, and also as No. 49, "not yet determined") Smyth 19-107, and 19-146: on sugar cane and malojillo grass seed-heads (the name given by Smyth for "malojillo", *Eriochloa subglabra*, is not a synonym of *Panicum barbinode*, but both grasses are called "malojillo" in Porto Rico, being similar in appearance and often growing together.)

(as *Balclutha osborni* Van Duzee) Wolcott 21-32: on sugar cane and malojillo grass.

on sweet potato (202-17), on carrots (448-17), on sedge, *Cyperus ferox* (222-13 det. as *Gnathodus* sp. by Mr. Gibson), on Bermuda grass (261-21), on sugar cane (298-19, 218-19, 546-16), on sugar cane or malojillo at Coloso, Vega Alta, Manatí and Bayaney (GNW).

**Eugnathodus guajanae** sp. nov. DeLong

Resembling *E. abdominalis* Van Duzee in form and coloration, but with distinct genitalia. Length 3.5—4 mm.

Vertex broadly rounded, almost parallel margined, about four times as wide between eyes as length at middle. Pronotum three and one-half times as long as vertex. Abdomen extending only slightly beyond apex of clavus.

Color: Yellow to pale brownish, often tinged with pink. In well marked specimens, the brownish or pink longitudinal vittae are distinct and cross vertex and pronotum. Elytra milky white, subhyaline, often tinged with pink. Beneath yellowish.

Genitalia: *Female* last ventral segment about twice as long as preceding, posterior margin rather deeply and narrowly notched at middle, forming two broadly-rounded lobes. *Male* valve triangular, apex blunt. Plates convexly rounded, apices narrowed, up-turned tips often visible from beneath. Pygoferes exceeding plates in length.

described from a series from arrows of sugar cane or "guajanas" at Río Piedras (377-22).  
(as "Cane Seed-Head Leafhopper" (*Balclutha* sp.) in part) Smyth 19-107: "In December and January it occurred in the greatest abundance in the seed tassels of such cane plants as bore seed, and is believed to have been a principal cause of the low fertility of the seed. For this reason it may be a serious retarding factor in production of new cane varieties. The nymphs, which are dark in color with lighter dorsal stripe, could be shaken by thousands from a single cane seed tassel. They are heavily preyed upon by larvae of a Syrphid fly" (*Allograptia limbata* Fabr.).

on sugar cane at Aguadilla (31-22), at Vega Alta (Jan. 21, 1920 GNW) and from Vieques Island (Dec. 20, 1919 GNW).

(See page 268.)

**Protalebra brasiliensis** Baker—det. DeLong

(as *Erythronura comes* Say) Wolcott 21-31, fig. 14: on sugar cane and *Wedelia trilobata*, notes on nymphs.

on carrots (533-17, 572-17, 683-17).

**Alebra aureovittatus** sp. nov. DeLong

Size and form of *curvilineata* with distinct coloration. Length 3 mm.

Vertex rather long and conical, very narrow between the

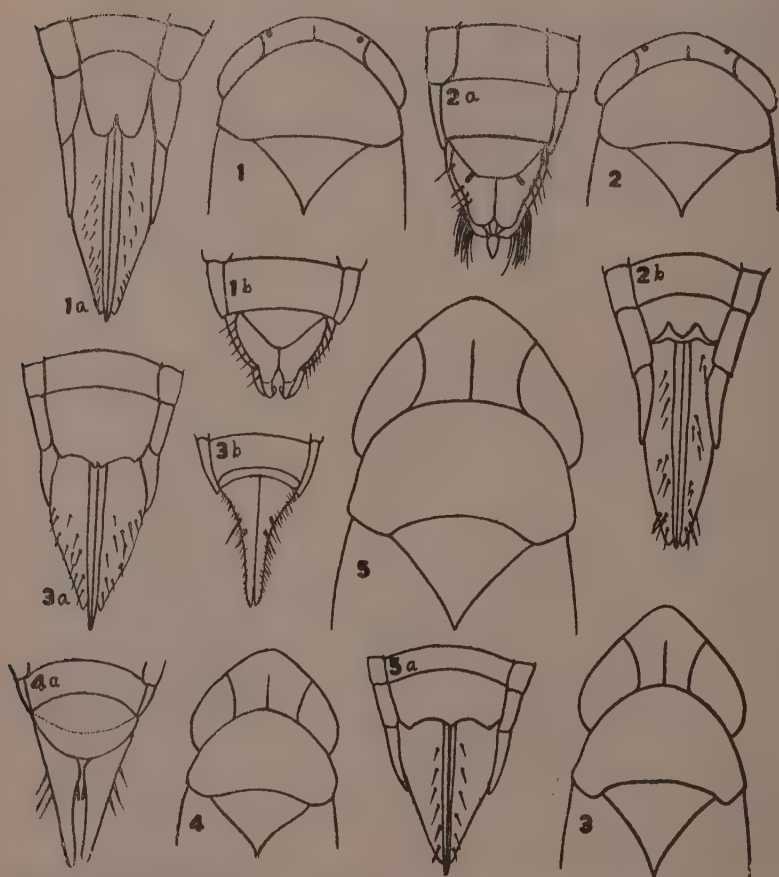


PLATE 2.—1, *Euganthodus guajanae*: 1 a, female genitalia; 1 b, male genitalia. 2, *Eugnathodus bisinatus*: 2 a, male genitalia; 2 b, female genitalia. 3, *Alebra aureovittatus*: 3 a, female segment; 3 b, male genitalia. 4, *Empoasca sermaculata*: 4 a, male genitalia. 5, *Empoasca brevidens*: 5 a, male genitalia. (Original. Drawn by D. L. DeLong.)

eyes, almost one-half longer on middle than width between the eyes. Pronotum wider than head, twice as wide as long, longer than vertex, posterior margin strongly concave, humeral angles prominent; scutellum proportionately large. Elytra much longer than abdomen.

Color: Vertex, pronotum and scutellum white, disc of pronotum bright yellow. Elytra white, a broad commissural line reaching to apex of clavus, outer claval vein and apex usually marked with yellow; a smoky spot on tip of clavus, one usually on costal area two-thirds the distance to apex and a round, dark brown spot on basal portion of central apical cell.

Genitalia: *Female* last ventral segment longer than preceding, lateral margins rounded to posterior margin, which is gradually produced to a central, angular, toothed portion. *Male* valve very short, longest at sides, concavely rounded. Plates rather narrow, extremely long, concavely rounded and produced about five times length of last ventral segment, set with numerous white hairs and each armed with two large black spines at about its middle.

described from a series of three females and four males, from underside of leaves of shoots of undetermined tree at Ciales (221–Aug. 22, 1922 GNW).

### ***Empoasca brevidens* sp. nov. DeLong**

Vertex roundingly, almost conically, produced, as long as width at middle, ocelli large and readily seen from above. Pronotum longer than vertex and more than twice as wide as long. Elytra rather long, greatly exceeding the abdomen. Veination of underwings rather unique: although there is only one closed cell, there is one open cell on the costal apical portion.

Color: Vertex, eyes, pronotum, scutellum and dorsum of body are shining black. Elytra smoky green at base, tips smoky, subhyaline. Face dull reddish above, yellow below. Ventral portion of thorax yellow, of abdomen shining black, last two segments milky white.

Genitalia: *Female* last ventral segment rather long, lateral angles prominent, posterior margin slightly excavated and produced at middle.

described from a single female from mountains north of Yauco on young coffee leaves (244–August 24, 1922 GNW). This species is quite distinct from other *Empoasca*, especially in wing veination and structure of the head.

### ***Empoasca mali* Le Baron (redetermined as *E. flavescens* Fabricius by DeLong)**

Barrett 04-448: "severest insect enemy of beans and cowpeas."  
Jones 15-3: "acute injury to garden beans, the leaves being badly curled and distorted."



Cotton 18-276: on a "great variety of plants", "great damage to bean".

Wolcott 21-33: "on cane when beans are growing between the rows."

on beans (406-13, 445-16, 480-16, 636-17, 444-17), on tobacco (1154-16), on carrots (534-17), beets (407-19), on sweet potatoes (449-17), all stages abundant on *Agati grandiflora*, causing yellowing and shedding of leaves (154-21 confirmed DeLong).

***Empoasca sexmaculata* sp. nov. DeLong**

Resembling *mali*, but with vertex more angulate and with brown spots on elytra. Length 2.3 mm.

Vertex bluntly, angularly produced, almost as long as width between eyes. Pronotum with prominent humeral angles. Elytra greatly exceeding abdomen. No cross vein in wing forming a short closed cell as in typical *Empoasca* species.

Color: Pale white to yellow, slightly tinted with green. A pale orange area close to base on costa, a large round spot on clavus just back of scutellum, a paler one just back of apex of clavus and a third one, pale, on inner margin of inner apical cell, brown. Face and beneath white, tinted with yellow.

Genitalia: *Female* last ventral segment rather long, roundly produced, posterior margin rather broadly embrowned. *Male* valve roundly produced, longer than last ventral segment. Plates rather narrow and greatly elongated, their inner margins turned in, to form tubular structures which are produced upwards.

described from a pair, on "emajagua", *Partium tiliaceum*, at Pt. Cangrejos, (Jan. 13, and May 29, 1920 GNW), causing yellowing of the leaves. Large and small nymphs present.

The male genitalia are very distinct from other *Empoasca*s.

FULGORIDAE.<sup>1</sup>

***Bothriocera venosa* Fowler—det. Muir**

(as sp. on *Palicourea crocea*) Stevenson 18-218: host of *Isaria saussurei* Cooke.

(as sp.) Smyth 19-146: on *Citrus* spp., *Palicourea* spp., *Anona* spp., *Piper aduncum*, sugar cane rarely; also from Vieques Island.

Wolcott 21-19: rare on cane, common on wild orange at Pt. Cangrejos.

(294-12, 618-16, 824-16), at light (149-17), on grapefruit (809-16, 33-20, 66-20); on *Banisteria laurifolia* at Martin Peña (843-14); on *Inga vera* at Añasco (341-13); on *Inga laurina* at Lares (147-22); common on coffee at Corozal, Ciales, Lares and Yauco (291-21); nymphs at Ciales, brown with

<sup>1</sup>Mr. Muir is publishing descriptions of several new species of Fulgoridae from Porto Rico in the Proceedings of the Hawaiian Entomological Society for 1923 (1924).

warts on head and thorax and with long iridescent spicules at caudum, and also swept from grass in coffee grove (61-21); on coffee, *Heckeria peltata* and very common on unidentified plant, many killed by fungus, in mountains north of Yauco (84-22).

**Oliarus cinereus** Wolcott 21-18, fig. 4, TYPE from Porto Rico: adults, singly or in coitu, common on cane, especially at Manatí and Sardinera.

(as sp.) Wetmore 16-66: eaten by Tody, *Todus mexicanus*.

(as sp.) Smyth 19-147: "Cotton-tail plant-hopper—quite common on young cane."

Tower 22-24: unsuccessfully used in transmission of mosaic disease of sugar cane experiments.

on tomato (1152-16), on carrots (536-17), on beans (205-16), on corn (517-17), on eggplant (RTC); on sugar cane (132-11, 143-11, 661-12), at Toa Baja (445-21, 256-22), at Guánica (40-22); constituting 5% of food of lizzard, *Anolis pulchellus* (GNW).

**Tangia angustata** Uhler—det. McAtee

on *Inga vera* (83-21); on coffee at Cayey (409-21); on pokeweed, *Phytolacca decandra*, and on *Heckeria peltata* in mountains north of Yauco (313-21); the green nymphs, with brush of widely-diverging, transparent-iridescent spicules at caudum, reared to adult on coffee (93-21), on *Erythrina glauca* (39-21) by Mr. Seín; on wild orange at Jajome Alto (23-21).

**Tangia** sp. (smaller)

on grapefruit at Vega Baja (531-16); on sea-grape, *Coccoloba uvifera* at Loíza (126-22).

**Thionia** sp.—det. Muir

nymphs abundant, and a few adults, on sea-grape, *Coccoloba uvifera*, at Loíza (122-22), at Mameyes (340-22).

**Acanalonia** sp. nov.—det. Muir, "near *depressa* Melichar"

on shrub in woods at Seboruco, Laguna de San José (234-23).

**Ormenis infuscata** Stal—det. Heidemann

all stages on sugar cane, under and on aguacate, *Persea gratissima* (674-12); adults on grapefruit at Vega Baja (518-16), at Vega Alta (157-15); on coffee at Lares (150-20).

**Ormenis marginata** Brunnich—det. Heidemann

(128-12), on sea-grape, *Coccoloba uvifera* (138-15); on *Lantana camara* at Carolina (51-15); on coffee at Utuado (148-20), at Corozal (295-21); on weeds at Vega Alta (127-17); on ornamental vine at Santa Isabel (183-12, 71-13).

**Ormenis pygmaea** Fabricius—det. Heidemann

Van Z. (606) on coffee.

(127-12), on *Jasminium pubescens* (268-16), on *Cordia cor-*

*ymbosa* (273-12), on coffee (173-21, 14-22 reared, eggs laid Sept. 1, 1921, hatched Sept. 12, first adult noted Dec. 1, fifteen on Jan. 15, 1922, one adult lived nearly a year), at Utuado (149-20, 138-20); on *Piper medium* at Vega Alta (128-17); on ornamental vine at Santa Isabel (71-13, 183-12); on sea-grape, *Coccoloba uvifera*, at San Juan (138-15, 129-15), at Pt. Salinas (232-16); on *Lantana camara* at Carolina (51-15); on sea-grape and very abundant on *Lantana camara* at Isabela and Hatillo (206-21); at light at Guánica (664-13) and on *Cordia cylindrostacha* (522-13, 293-16).

**Ormenis quadripunctata** Fabricius—det. Muir

(as sp.) Van Dine 13-257; Smyth 19-147: "found breeding on cane leaves in one instance."

all stages on sugar cane (under) and on aguacate tree (674-12 det. Heidemann); on *Cordia corymbosa* (273-12); on grapefruit (64-20), at Plantaje (32-16), at Sabana Llana (128-15), at Vega Baja (519-16), at Espinosa (507-17); on *Lantana camara* at Martin Peña (841-14), at Mameyes (341-22), at Guánica (GNW—det. Muir); on castor bean at Luquillo (95-16); on sea-grape at Isabela (205-21).

**Ormenis** spp. (referring to some or all of the above species)

Wetmore 16-66, 71, --- 128: eaten by Tody, Hummingbirds, Flycatcher, Pewee, Cliff Swallow, Vireos, Redstart, five Warblers, Honey Creeper, Mozambique and Grasshopper Sparrow.

**Cyarda** sp.

Wolcott 23-46: on coffee.

on sea-grape, *Coccoloba uvifera*, at Pt. Cangrejos (397-22); on wild Bougainvillea vine at Cayey (360-22); on grapefruit at Vega Alta (129-17), at Vega Baja (530-16); on coffee at Utuado (475-21, 252-22), at Corozal (458-21), at Lares, Yauco, Ciales and Corozal (288-21).

**Flatoides** sp.

on coffee at Maricao (406-21), at Aibonito (RTC)

**Flatoides** sp.

at light (321-22); on trunk of sea-grape at Isabela (204-21).

**Neocenchrea** sp.—det. Muir

on unidentified palm in mountains north of Yauco (236-22) in great abundance. Adults light yellow with white bloom, a black spot at inner angle of forewing and two or more small ones at tip on outer margin.

**Ugyops** sp.—det. Muir

on trunk of *Inga laurina* at Lares (639-21, 108-22), at Adjuntas (271-22); on trunk of coffee tree in mountains north of Yauco (238-22).

**Saccharosydne saccharivora** Westwood

(as *Delphax*) Van Dine 12-20 to 22: on sugar cane, early references, collections in Porto Rico, life history and parasites.

(as *Delphax*) Van Dine 13-256; Van Dine 13-32; Van Z. (309) on sugar cane.

(as *Stenocranus*) Smyth 19-147: on sugar cane.

(as *Delphax*) Jones 14-463: eggs parasitized by a Mymarid, identified as *Anagris armatus* Ashmead by Mr. Girault.

(as *Stenocranus*) Pierce, W. Dwight, in Proc. Ent. Soc. Washington, Vol. 16, No. 3, Sept. 1914, p. 126: host of a new genus and a new species of Strepsiptera, *Stenocranophilus quadratus*.

(as *Delphax*) Wolcott 21-14, fig. 2: life history and abundance. Illustration of adult and nymph.

(as *Stenocranus* (*Delphax*)) Tower 22-24: unsuccessfully used in mosaic disease of sugar cane transmission experiments.

on sugar cane (123-11, 141-11, 974-13, 165-19, 242-19, 157-21), at Luquillo (196-13), at Arecibo (186-11), at San Sebastián (21-22), at Guánica (238-11), throughout the Island but rare on south side.

**Neomalaxa flava** Muir—det. Muir

on cohite grass, *Commelina elegans*, at Ciales (278-21), at Lares and generally in the mountains. The nymphs produce five long filaments from the caudum, besides many smaller ones, and fine threads from the thorax.

**Nilaparvata wolcottii** Muir MS, TYPE from Porto Rico.

on malojillo grass at Pt. Cangrejos (GNW).

**Sogota cubanus** Crawford—det. Muir

(as *Megamelus flavolineatus* Muir) Wolcott 21-18, fig. 3: on sugar cane, both nymphs and adults.

(as *Perkinsiella* sp. "White-lined plant-hopper") Smyth 19-148: on sugar cane, rice and grasses.

on rice (41-20), on carrots (573-17, 535-17); on sugar cane at Toa Baja (286-21, 446-21).

**Sogota approximata** Crawford—det. Muir

on malojillo grass at Pt. Cangrejos (GNW); on grasses in cane fields at Toa Baja (447-21).

**Peregrinus maidis** Ashmead—det. Heidemann

Jones 15-2: on corn. Cotton 18-291: life history and control.

all stages on corn (532-12, 278-16, 446-17, 42-20), a common and rather serious pest; a single adult from leaf of sugar cane at Santa Isabel (72-13).

**Delphacodes havanensis** Crawford—det. Muir

on malojillo grass at Pt. Cangrejos (GNW).

**Delphacodes humilis** Van Duzee—det. Muir

on malojillo grass at Pt. Cangrejos (GNW); on guinea grass, *Paspalum hemisphaericum*, (107-12, 444-12 det. as "near *humilis*" by Mr. Heidemann).

**Delphacodes propinqua** Fieber—det. Muir

on malojillo grass at Pt. Cangrejos (GNW).

**Delphacodes teapae** Fowler—det. Muir

(as *Liburnia*) Wolcott 21-18: at light, on sugar cane, on malojillo and carpet grasses.

on carrots (542-17, 576-17); on carpet grass, *Axonopus compressus*, in coffee grove at Ciales (66-21); on malojillo grass at Mayagüez (38-23).

**Ladella pallida** Walker.

TYPE from Porto Rico.

on malojillo grass at Río Piedras (March 31, 1920 GNW—det. Dr. H. L. Dozier).

PSYLLIDÆ.

**Psylla minuticon**a Crawford—det. McAtee

common on *Inga vera* at Lares (163-22) and throughout the coffee districts.

**Euphalerus nidifex** Schwarz—det. McAtee

adults on watershoots of *Ichthyomethia (Piscidia) piscipula* at Yauco (324-23); whitish nymphal skins common on host at Boquerón and Pt. Cangrejos (GNW).

**Heteropsylla mimosae** Crawford—det. McAtee

very abundant on *Acacia farnesiana* at Guánica and Guayanilla (GNW), at Guánica (103-13).

(undetermined Psyllids on *Pithecolobium saman* (431-16)).

ALEYRODIDÆ.

LITERATURE.

Quaintance, A. L. & Baker, A. C., "Classification of the *Aleyrodidae*, Part 1 & 2", Bull. 27, Bur. Ent. (Technical Series) U. S. Dept. Agr., Washington, D. C., March 6, 1913.

Cotton, R. T., "*Aleyrodes citri* not in Porto Rico" in Jour. Ec. Ent., Vol. 10, No. 3, June, 1917, p. 377.

**Aleurothrixus floccosus** Maskell

(material in U. S. Bureau of Entomology collection.)

**Aleurothrixus howardi** Quaintance

(as *Aleyrodes*) Tower 11-11: on guava and orange, life history and control.

Van Z. (4) on guava and orange. Cotton 17-377: on guava, on orange at Pueblo Viejo (302-12); on grapefruit (898-14, 775-19), at Vega Alta (123-17); on *Citrus decumana* at Espinosa (82-15); on guava, *Psidium guajava*, (753-13 det. Quaintance).

**Aleurodes trachoides** Back

Van Z. (911) on *Solanum nigrum*, *S. scaberrimum*, eggplant, tomato and pepper.

on *Solanum torvum* (65-17), (determination doubtful, on tobacco (378-17)).

**Aleurodicus** sp. nov.—det. Quaintance

on *Myrcia* sp. at Pt. Cangrejos (7-15); on *Eugenia buxifolia* at Pt. Cangrejos (975-13, 49-15, 163-15) and on *E. latibunda* (50-15).

**Aleurodicus (Metaleurodicus) minimus** Quaintance, A. L., Contributions toward a Monograph of the American Aleurodidae", Bull. 8, Bur. Ent. (Technical Series) U. S. Dept. Agr., pp. 43-47, pl. vi, figs. 63-67, 1900, TYPE from Porto Rico: "on *Guayava* sp." "a large number killed by a fungus."

Quaintance and Baker 13-77: generic transfer to *Metaleurodicus*,

Cotton 17-377: on guava.

Johnston 15-11; Stevenson 18-218: host of *Aegerita webberi* Faw.

Johnston 15-12 to 14; Stevenson 18-203: host of *Aschersonia aleyrodi* Webber and *A. flavo-citrina* P. Henn.

on *Psidium guajava* (115-12, 211-12, 379-13, 754-13 det. Quaintance), at Arecibo (230-19).

**Bemisia** sp., "probably new"—det. Quaintance  
on *Euphorbia hypericifolia* (23-15).

**Dialeurodes busckii** Quaintance & Baker, TYPE from Porto Rico.

**Leonardius lahillei** Leonardi

Quaintance & Baker 13-39 to 41, pl. ix: on *Phoradendron* parasitic on almond at Mayagüez; redescribed and figured.

Van Z. (1617) on *Phoradendron* sp.

**Tetraleurodes ursorum** Cockerell, T. D. A., TYPE from Porto Rico: collected by August Busck, Jan. 12, 1899, on *Cocco-loba* sp.

undetermined Aleyrodidae on *Canna* sp. (1155-16, 269-16); on *Scoparia dulcis* (10-17); on *Bignonia unguis* (59-18); on *Bocconia frutescens* (750-13); on coconut palm (135-16).



## APHIDÆ.

## LITERATURE.

Jones, Thos. H., "Aphides or Plant-Lice Attacking Sugar Cane in Porto Rico" Bull. 11, Insular Experiment Station, Río Piedras, P. R., March 15, 1915, pp. 1-19, pl. 2.

Wolcott, G. N., "Aíidos de Importancia Económica en Puerto Rico" Circ. 59, Insular Experiment Station, Río Piedras, P. R., 1922, pp. 1-11, fig. 9.

**Sipha flava** Forbes—det. Monell & Davis

(as *S. graminis* Ktl.) Van Dine 13-257; Van Dine 13-32: on sugar cane.

Jones 14-462; Smyth 19-148; Van Z. (307), on sugar cane.

Jones 15-3: an extended account, giving predators and parasites.

Johnston 15-10; Stevenson 18-207: host of *Acrostalagmus albus* Pr.

Wolcott 21-33; Wolcott 22-4: notes, on sugar cane.

Smyth 19-103; Wolcott 21-47 (after Smyth); Tower 22-25: unsuccessfully used in transmission of mosaic disease of sugar cane experiments.

Van Zwaluwenburg 18-28: "a serious outbreak on young cane at Ponce."

Smyth 19-122: "a severe outbreak at Río Piedras and at Fortuna."

on sugar cane (328-12, 925-13), at Guánica (166-11; 515-13, 342-13), at Trujillo Alto (722-12), at Juneos (27-19), common on this host, sometimes occurring in such abundance over entire fields of young cane as to cause serious injury before the many predators and parasites can bring it under control; on sorghum (498-13), on lemon grass, *Andropogon nardus cerifer* (347-13).

**Aphis maidis** Fitch

Cotton 18-291: the corn leaf aphid, notes and control by insect enemies.

Wolcott 21-34: "not found on cane in Porto Rico."

Wolcott 23-45: adults found on young plant cane at Guánica, nearly half of which had mosaic disease two months later.

Chardón, C. E. & Veve, R. A., "The Transmission of Sugar-Cane Mosaic by *Aphis maidis* under Field Conditions in Porto Rico" in *Phytopathology* Vol. 13, No. 1, January 1923, pp. 24-29, fig. 1:

"1. *Aphis maidis* is found, with more or less abundance, in various grasses occurring in the sugar cane fields of Porto Rico.

"2. After the weeding of the fields, *Aphis maidis* passes to sugar

cane plants, living in the central whorl of leaves for a period of time.

- "3. During the short time that it stays on cane, *Aphis maidis* transmits the infective substance of the sugar cane mosaic and carries the disease from diseased to healthy plants."

Chardón 23-65 to 67: the same data.

on corn (273-16 det. Wilson); on sorghum (523-12 "resemble *Aphis avenae*" Monell); on malojillo grass, *Eriochloa subglabra*, from Fajardo (142-22 det. Baker) in cages used by Chardón & Veve in mosaic transmission experiments; on sugar cane at Bayamón, in central whorl, May 5, 1920 (GNW) "only early stage nymphs present so cannot determine" A. C. Baker; adults on sugar cane at Guánica (420-21 det. Patch); constituted a sixth of the food of seven lizzards, *Anolis pulchellus*, at Río Piedras (GNW).

### ***Aphis nerii* Boyer—det. Patch**

Wolecott 22-4: on *Asclepias curassavica* and *Calotropis procera*, a large yellow aphid with antennae and legs black, common on the smaller milkweed in the moister sections of the Island, and on the giant milkweed in the dryer sections.

at Lares (418-21), at Yauco (104-14).

### ***Aphis gossypii* Glover**

Barrett 05-396: on cotton. Smyth 20-124: on cotton.

Jones 15-3: on cucumber, predators and parasitic insects and fungi mentioned.

Cotton 18-294: on cucumber, control by spraying.

Wolecott 22-4: on cotton and melon.

(as sp.) Stevenson 18-207: host of *Acrostalagmus albus* Pr.

on *Psidium guajava* (64-23 det. Baker), on cucumber (394-12 det. Pergande, 43-16); very destructive to honey-dew melons at Condado near the beach, but controlled by spraying when the plants were young (Lee II. Vendig); on cotton (595-16, 423-21 det. Baker), at Sabana Grande (357-21), at Isabela and Hatillo (197-21) "most abundant on fields just behind sand dunes and close to the ocean, and even in these fields, only a small number of plants were heavily infested; attended by *Prenolepis longicornis* Latr. and furnishing food for several species of predators"; on *Cecropia peltata* at Lares (97-22 det. Baker).

### ***Brevicoryne brassicae* Linnaeus**

(as *Aphis*) Cotton 18-283: on cabbage, control.

on Chinese mustard (31-18).

### ***Carolinaia cyperi* Ainslie—det. Baker**

Wolecott 23-45; Chardón 23-66: on *Cyperus rotundus*, a common sedge in cane fields.

(421-21), at Bayamón (422-21), at Barceloneta and Arecibo (9-22).

**Hysteroneura setariae** Thomas—det. Davis

(as *Aphis*) Jones 15-4: "The Brown Sugar Cane Aphis", not common and occurs in small numbers at the junction of the leaf-sheaths and blades of young cane, covered with sheds of earth built over them by ants, *Solenopsis geminata* Fabr.

(as *Aphis*) Jones 14-462; Smyth 19-148: on sugar cane.

(as *Aphis*) Wolcott 21-34: scarcity on sugar cane, notes.

on sugar cane (329-12, 696-12, 92-13, 923-13), at Loíza (DLVanD), at Mameyes (795-12), at Arroyo (DLVanD), at Manatí (GNW); on stems, leaves and spike of wire grass, *Eleusinia indica* (289-22 det. Baker).

**Rhopalosiphum persicae** Sulzer—det. Wilson

(as *Aphis* sp.) Stevenson 18-207: host of *Acrostalagmus albus* Pr.

Cotton 18-296: on eggplant and pappars, notes.

Wolcott 22-5: mention.

on eggplant (33-16, 52-16), on pepper (272-16, 422-16, 17-170), on sweet potatoes and sesame (809-19 det. Smyth).

**Toxoptera aurantiae** Boyer

(as *T. aurantii* Boyer) Van Zwaluwenburg 17-516: on young shoots of coffee, orange and "geo"; notes and control by fungus, *Acrostalagmus albus*.

Wolcott 22-6: on mamey, *Mammea americana*, coffee, cacao and *Citrus* spp., illustration of the curling of the leaves of the latter by the aphids.

on mamey and grapefruit at Plantaje (28-16), on grapefruit (34-16 det. Wilson), on *Murraya exotica* (134-17 det. Wilson); on cacao at Ciales (471-21); on mamey and sea-grape at Pt. Salinas (68-22) attended by *Monomorium destructor* Jerdon; common on coffee throughout the Island, eaten by Honey Creeper, *Coereba portoricensis* (153-23) from this host.

**Amphorophora lactucae** Kalt.—det. Baker

on lettuce (182-19, 61-22), on wild lettuce at Adjuntas (96-22).

**Macropsiphum illinoiensis** Shimer (*viticola* Thomas)—det. Patch

Wolcott 22-6: on *Cissus sicyoides*.

on host (162-21, 417-21).

**Macropsiphum** sp.—det. Baker

on dandelion (143-22).

**Pentalonia nigronervosa** Coquillett—det. Baker

on cultivated *Calla* (imported) (134-22), abundant on stems of banana (280-23 det. P. W. Mason), of yautía and malanga (F. Seín).

**Cerataphis lantaniae** Boisduval—det. Baker

(as *Calaphis latariae*) Smyth, E. G., "Plant Inspection and Quarantine Report" Bull. 23, Insular Experiment Station,

Río Piedras, P. R., September 1919, p. 61: "a serious pest of ornamental palms at Río Piedras. Twice intercepted on orchids from Venezuela."

on Chinese fan palm, *Livistona* sp. (42-19, 44-19, 61-23).

## COCCIDÆ.

## LITERATURE.

**Busck, A.**

00-88 to 93.

"Notes on a Brief Trip to Puerto Rico in January and February, 1899," including a "List of the Coccidae Collected by Mr. A. Busck in Porto Rico." By T. Pergande and T. D. A. Cockerell. Bull. 22, new series, Div. Ent. U. S. Dept. Agr., 1900. pp. 88-93.

**Fernald, Mrs. M. E.**

03-1 to 360.

"Catalogue of the Coccidae of the World." Bull. 88, Mass. Agr. Expt. Sta., 1903. pp. 1-360.

**Jones, T. H.**

17-1 to 16.

"A List of the Coccidae of Porto Rico." Jour. Board of Comm. of Agr., P. R., Vol. 1, No. 1, January 1917. pp. 1-16.

The section on Coccidae has been prepared by Mr. J. D. More. The paper by Mr. Thos. H. Jones, (17-1 to 16) contains all records from the Insular Experiment Station collection up to the date of its publication, but to avoid repetition, all, including the more recent records, are here listed as though all were original and only when the record given by Mr. Jones has not been found in the accession catalogue of the Station, has it been noted in the reference to his paper. Practically all the determinations for the list given by Mr. Jones were by Mr. E. R. Sasser and E. W. Rust, but Mr. Harold Morrison and Prof. G. F. Ferris have made most of the recent determinations. In addition, records for an unpublished list by Dr. Hooker, of the Mayagüez Station, have been included.

## MONOPHLEBINÆ.

***Icerya montserratis*** Riley and Howard

Busck 00-92: on orange at Mayagüez and Bayamón.

Tower 08-38: on orange.

Van Z. (10): on orange at San Juan; on *Inga vera*, *Inga laurina*, *Byrsonima spicata*, *Casearia sylvestris*, *Cocos nucifera*, *Pithecolobium saman*, and *Psidium guajava*.

on *Chrysophyllum argenteum* (1204A-13), *Ficus nitida* (37-21), on undetermined tree at Santurce (578-12); on citrus at Dorado (139-16); on *Calophyllum calaba*, at Point Canegrejos (261-16); on *Inga vera* at Ciales (468-21); on *Ficus nitida* at Manatí (351-21).

## MARGARODINAE.

**Margarodes formicarum** Guilding

Wetmore 16-50, 61, 119: eaten by Ground Dove, Ani, and Mozambique.

on roots of grapefruit at Manatí (136-20 det. by More, confirmed by Morrison).

## ORTHEZIINAE.

**Orthezia insignis** Douglas

Van Z. (2007): on *Coleus* sp., *Ipomoea fastigiata*, *Lantana camara*, chrysanthemum, tomato, *Hamelia patens* and *Lactuca*.

Jones 17-4: on *Bignonia* sp. and *Ipomoea tiliacea* at Río Piedras.

on *Coleus* sp. (118-16), on *Ipomoea tiliacea* at Dorado (736-13 det. Rust); on *Eupatorium odoratum* at Comerío (752-13); on *Lantana camara* at Yauco (702-14); on *Bignonia* sp. and rose-bush cuttings at Aibonito (106-15).

## CONCHASPINAE.

**Conchaspis angraeci** Cockerell

Van Z. 17-34: on vanilla at Mayagüez. "Not likely to become important."

on branches of an ornamental croton (*Codiaeum* sp.) at Mayeyes (825-12).

## ASTEROLECANIINAE.

**Asterolecanium aureum** Boisduval

Busck 00-92: on leaves of a fiber plant, at San Juan.

**Asterolecanium bambusae** Boisduval

Busck 00-92: on bamboo at Bayamón and Utuado.

Van Z. (1613).

on bamboo (758-14, det. Rust), at Trujillo Alto (37-15).

**Asterolecanium lanceolatum** Green

on leaves of bamboo (758-14 det. Rust).

**Asterolecanium pustulans** Cockerell

Busck 00-92: on *Anona muricata* at San Juan, on leguminous plant at Guayama.

Barrett 03-446: on *Ficus carica* at Mayagüez.

Fernald 03-52: Porto Rico.

Van Z. (1635): on rubber, silk-oak, *Anona reticulata*.

on silver-oak, *Grevillea* sp. (410-13 det. Rust), on *Sida antillensis* (801-14), on *Jasminum sambac* (863-14), on *Bauhinia* sp. (1-17), on *Conocarpus erectus* (11-17), on *Bougainvillea* (55-16), on oleander (356-21 det. Wolcott, confirmed by Morrison), on *Cassia fistula* (68-23), on mulberry (526-23); on *Achras sapota* at Vieques Island (421-19); on oleander and gaultheria at Pt. Cangrejos (356-21); on cotton at Maunabo (5-22 det. Ferris); on *Inga vera* at Cayey (6-23).

## PSEUDOCOCCINAE.

**Phenacoccus** sp.

(as *Phenacoccus gossypii* Towns. and Ckll.) Busek 00-92: on cotton at Humacao, "new to the West Indies."

(as *Phenacoccus helianthi* var. *gossypii*) Maxwell-Lefroy, H., in "Scale Insects of the West Indies." West Indian Bul., Vol. III, No. 4, 1962, pp. 295-319, on p. 298: "Porto Rico."

Johnston 15-22; Stevenson 18-134: host of *Empusa freseni* at Río Piedras.

on *Acalypha wilkesiana* (478-12 det. Morrison): on cotton at Maunabo (5-22 det. Ferris).

**Pseudococcus bromeliae** Bouché

on young bud coming out from roots of sugar cane at Guánica (648-21 det. Ferris): on roots of *Cyperus rotundus* at Guánica (3-22): on banana rootlets at Corozal (GNW).

**Pseudococcus calceolariae** Maskell

Jones 14-461: first record from Porto Rico.

Johnston 15-14: host of *Aspergillus flavus* at Carolina, Río Piedras, Fajardo, Santa Rita, Guánica.

Johnston 15-25: host of *Isaria* sp. at Río Piedras.

Smyth 19-102: used in transmission of mosaic-disease experiment.

Smyth 19-149: on sugar cane.

Wolcott 22d-17: not eaten under field conditions by introduced lady beetle, *Cryptolaemus montrouzieri* Muls.

on internodes of sugar cane behind leaf-sheaths (852-12 det. Green).

**Pseudococcus citri** Risso

(as *Dactylopius*) Barrett 03-445: an enemy of citrus stock, not common.

Tower, W. V., "Control of the Brown Ant (*Solenopsis geminata* Fabr.) and the Mealy Bug (*Pseudococcus citri* Risso) in Pineapple Plantations." Circ. 7, P. R. Agric. Expt. Sta. p. 3.

Hooker 12-35, 37: in coffee plantations.

Van Z. (5): on *Ananassa ananas* and orange.

on the roots of *Apium graveolens* (531-12 det. Morrison), *Zea mays* (543-12), and a grass probably *Sporobolus jacquemontii* (554-12), on *Piper* sp. (316-22): on roots of coffee trees at Maricao (408-21 det. Morrison): on the tender twigs of coffee trees at Ciales (469-21): on *Heckeria peltata* at Yauco (89-22).

**Pseudococcus longispinus** Targioni

Van Z. (611): on coffee.

on "jasmín" vine (53-18 det. EGS), on grapefruit (200-19 det. EGS), on citrus (72-20 det. EGS): on "jasmín" vine at Sabana Llana (313-22 det. Ferris).



**Pseudococcus nipae** Maskell

Johnston 15-19: host of *Cephalosporium lecanii* at Río Piedras.

Johnston 15-21; Stevenson 18-134: host of *Empusa fresenii* at Río Piedras.

Stevenson 18-207: host of *Botrytis rileyi* at Río Piedras.

Van Z. (1201): on *Persea gratissima* and *Psidium guajava*.

on *Psidium guajava* (270-12), *Anthurium ucaule* (10-14), on *Anona muricata* (289-12), on *Chrysophyllum argenteum* (583-12), on *Musa paradisiaca* var. (585-12), on *Miconia prasina* (235-13), on *Anona reticulata* (12-14), on *Tetrazygia elaeagnoides* (40-14), on *Cocos nucifera* (120-15 det. Rust), on *Anona reticulata* and *Livistona palm* (61-18), on *Erythrina glauca* (60-18); on *Cocos nucifera* at Santurce (215-11); on palm at Santa Isabel (427-13); on *Persea gratissima* (50-14), and *Coccoloba uvifera* (51-14) at Naguabo; on *Sterculia apetala* at Salinas (34-15); on *Cocos nucifera* at Arcibo (282-19); on *Achras sapota* at Vieques Island (423-19); on *Anona muricata* at Maricao-Mayagüez (83-22).

**Pseudococcus sacchari** Cockerell

(as *Dactylopius*) Busek 00-92: on sugar cane at Bayamón, Mayagüez and Humacao.

Fernald 03-109: in Porto Rico.

Van Dine 11-18, 29; Van Dine 12-19, 20; Van Dine 13-251, 252, 253, 255, 256; Van Dine 13-31: on sugar cane.

Jones 14-461: parasitized by *Karschomyia cocci* Felt.

Van Z. (310): on sugar cane.

Stevenson 18-207: host of *Aspergillus flavus* at Río Piedras, Patillas, Fajardo, Carolina and Guánica.

Smyth 19-102: used in transmission of mosaic-disease experiments.

Smyth 19-149: on sugar cane.

Wolcott 22d-17: not eaten under field conditions by *Cryptolaemus montrouzieri* Muls.

on sugar cane (2-18, 222-19, 225-19); on sugar cane under leaf-sheaths, at Guánica (13-10), at Loíza (20-10), at Vega Alta (61-10), at Fajardo (19-11), at Caguas (3-18), at Guánica (2-22 det. Ferris).

**Pseudococcus virgatus** Cockerell

on ornamental croton, *Codiaeum* sp. (712-17 det. Morrison), on *Hibiscus esculentus* (678-17), on *Achrysanthis indica* (315-22 det. Ferris); on *Terminalia catappa* at Manatí (290-22 det. Ferris); on cotton at Vega Baja (5-23 det. Ferris).

**Antonina (Chaetococcus) bambusae** Maskell

Van Z. (1614): on bamboo at Mayagüez.

on bamboo, under leaf-sheaths at Mayagüez (82-22 det. Ferris).

## COCCINAE.

**Pulvinaria iceryi** Guerin (= **P. elongata** Newstead).

Smyth 19-104: first record in Porto Rico, on sugar cane, used in transmission of mosaic disease.

Smyth 19-149: on sugar cane.

Wolcott 21-47: an apparent 6.6% success of transmission of mosaic disease of sugar cane obtained by Smyth.

Wolcott 21-35: on sugar cane.

**Pulvinaria psidii** Maskell

Tower 08-38: on orange and coffee.

Hooker (1250) : on *Chrysophyllum cainito*, at Mayagüez.

Van Z. (11): on orange, *Achras sapota* and mango.

Wolcott 22d-111: on *Rauwolfia nitida* at Guánica.

on *Psidium guajava* (424-12), on *Mangifera indica* (530-12), on *Spondias lutea* (545-12, 781-16); on twigs and petioles of *Citharexylum fruticosum* (62-23); on *Spondias lutea* at Arroyo (172-12); on *Rauwolfia tetraphylla* at Ponce (131-13); on *Psidium guajava* at Luquillo (922-13); on coffee at Adjuntas (493-21).

**Cryptostigma (Pseudophilippia) inquilina** (Newstead) Ferris

(as *Pseudophilippia inquilina*) Newstead, R., in Bull. Ent. Res. 10; 181 (1920): TYPE from Jamaica.

(as *Cryptostigma ingae*) Ferris, G. F., in Can. Ent., LIV, No. 7, July 1922, pp. 160-161, fig. 4: TYPE on *Inga laurina* at Lares, Porto Rico.

(as *Akermes secretus*) Morrison, H., in Psyche, Vol. XXIX, No. 4, August 1922, pp. 145-748, Pl. VI, fig. 20-31: HOLOTYPE and PARATYPES on *Inga laurina* at Mayagüez; PARATYPES on "guama" at San Juan.

(as a pinkish scale), Tower 11-32: in coffee shade trees.

(as a pink scale of the subfamily Coccinae) Hooker 13-35: on *Inga laurina* and coffee.

(as an undetermined pink *Coccus*) Van Zwaluwenburg 14-34; 15-42; 17-515: on *Inga laurina* and coffee.

Wolcott 23-58: in tunnels of "hormiguilla" in *Inga vera* and *Inga laurina*.

in twigs of *Inga laurina* at Lares (6-22 TYPE); of *Ficus laevigata* at Manatí (362-23 det. Ferris).

**Ceroplastes ceriferus** Anderson

on *Bursera simaruba* at Guánica (234-11 det. Sasser, 334-13); on *Sauvagesia erecta* at Naguabo (58-14).

**Ceroplastes cirripediformis** Comstock

on *Myrcia paniculata* at Algarrobo (792-14 det. Rust).

**Ceroplastes cistudiformis** Townsend and Cockerell

Van Z. (1631): on *Euphorbia robusta* and *Ipomoea fastigiata*.

**Ceroplastes floridensis** Comstock

Busck 00-92: on *Anona reticulata*.

Barrett 03-445: on citrus.

Tower 08-38: on rose and orange.

Van Z. (16): on orange, *Psidium guajava*, *Ipomoea* sp., *Mangifera indica* and *Anona reticulata*.

on *Rapanea guianensis* (59-15 det. Rust), on grapefruit (118-15, 164-15), on *Persea gratissima* (50-18); on *Ficus laevigata* at Yabucoa (139A-16); on *Laguncularia racemosa* at Fajardo (162-23 det. Morrison).

**Vinsonia stellifera** Westwood

Busck 00-92: on *Cocos nucifera* at Cataño, Arroyo and Bayamón.

(as sp.) Barrett 03-446, 447: on rose apple (*Jambos jambos*) and coconut.

Van Z. (1214): on *Mangifera indica*, manila hemp, *Musa* sp., *Eugenia jambos*, coconut, *Agave sisalana* and *Psidium guajava* at Mayagüez.

on *Coccoloba laurifolia* (11-14 det. Van Dine), on *Eugenia jambos* (437-12), on undetermined plant (236-13), on *Lawsonia inermis* (265-16); on *Cocos nucifera* at Santurce (214-11); on *Eugenia jambos* at Mameyes (831-12); on *Mangifera indica* at Santa Isabel (397-13); on orchid leaves at Martin Peña (222-16); on *Achras sapota* at Vieques Island (422-19).

**Inglisia vitrae** Cockerell

Jones 17-7: on *Cajanus indicus* at Mameyes and Comerío.

on *Bixa orellana* (35-14); on *Inga vera* at Guayama (380-21 det. Morrison).

**Coccus hesperidum** Linnaeus

on *Agave sisalana* (2-15 det. Rust); on *Agave sisalana* at Trujillo Alto (92-16).

**Coccus mangiferae** Green

Van Z. (1215): on *Solanum* sp., *Cinnamomum zeylanicum*, *Mangifera indica* and *Artocarpus communis*.

Johnston 15-19: host of *Cephalosporium lecanii* at Río Piedras.

Stevenson 18-207: host of *Botrytis rileyi* at Río Piedras.

on *Eugenia jambos* (437-12), on *Blighia sapida* (223-16); on *Nectandria* sp., at Plantaje (27-16).

**Saissetia hemisphaerica** Targioni

(as *Lecanium*) Busck 00-92: on eggplant at Cataño, on coffee at Caguas.

(as *Lecanium*) Barrett 03-444, 445, 446, 447: on coffee, *Anona muricata*, cassava; probably the most common scale on orange.

(as *Lecanium*) Earle 03-458, 459, 463: on orange and at times abundant and destructive to coffee.

Tower 07-26; 08-32; 08-23; 11-15: injurious to citrus trees.

- Jones 15-4: on eggplant. Illustration, pl. 1, fig. 1.  
 Johnston 15-19: host of *Cephalosporium lecanii* at Río Piedras. (as *Lecanium* sp.) Wetmore 16-66, 166, 116, 119, 121: eaten by P. R. Tody, Parula Warbler, Oriole, Mozambique and Tanager.  
 Cotton 18-301: on eggplant. Illustration.  
 Stevenson 18-208: host of *Cephalosporium lecanii* at Río Piedras, Espinosa, Bayamón, Vega Baja, Comerío, Sabana Llana.  
 Smyth 19a-126: on *Murraya exotica*.  
 Van Z. (9): on orange, *Coffea arabica*, *Anona reticulata*, *Antigonum leptopus*, *Solanum seafortianum* and *Drypetes glauca* at Mayagüez.  
 on *Schinus molle* (425-12), on *Gardenia jasminoides* (291-12, 485-12, 41-19, 45-19); on *Eugenia jambos* (437-12), on *Graptophyllum pictum* (586-12, 270-16); on *Solanum melongena* (925A-13, 547-16); on *Psychotria* (74-15), on *Palicourea* sp. (76-15), on undetermined plant (77-15), on grapefruit (119-15), on *Myrcia deflexa* (78-15), on *Momordica charantia* (151-16), on *Lawsonia inermis* (265-16), on *Lagerstroemia indica* (267-16), on coffee (271-16), on *Persea gratissima* (761-19), on undetermined plants (550-12, 234-13); on *Schinus molle* at Guánica (229-11); on *Psidium guajava* at Luquillo (476-12); on *Sida* sp. at Luquillo (474-12); on *Solanum nigrum* var. *americanum* at Luquillo (473-12); on *Zamia integrifolia* at Vega Alta (544-12); on coffee (833-12), on *Thunbergia erecta* (830-12) at Mameyes; on *Rauwolfia tetraphylla* at Ponce (132-13); on *Leptilon canadense* (789-13), on orchid and coffee (50-21) at Ciales; on balsam at Arecibo (11-15); on *Achyranthes indica* on Carolina road, (57-15); on *Phoradendron antillarum* at Juana Díaz (71-15); on fern at Bayamón (142-15); on *Zamia integrifolia* (116-16), and mamey seedling (117-16) at Vega Baja; on cycad and *Gardenia jasminoides* at San Juan (447-19); on coffee, at Lares (165-20), at Adjuntas (92-22) and at Maricao (171-22).

### **Saissetia nigra** Nietner

- (as *Lecanium nigrum* var. *depressum* Targ.) Busek 00-92: on *Terminalia catappa* at San Juan; on cotton at San Juan.  
 Fernald 03-204, 205: from Porto Rico.  
 Hooker (1653): on *Hura crepitans* and *Euphorbia sanguinea* at Mayagüez.  
 on *Schinus molle* (287-12), on *Melia azedarach* (554-16), on *Coleus verschaffeltii* (275-16), on *Ionoxalis intermedia* (4-17), on *Terminalia catappa* (93-22); on *Pavonia typhalaea* at Canóvanas (246-13); on *Gossypium barbadense* at Guánica (480-13); on *Melia azedarach* at Fortuna (396-13); on *Solanum nigrum* var. *americanum* (473-12), on *Sida* sp. (474-12), and on *Melia azedarach* (788-12) at Luquillo; on *Thespesia grandiflora* at Manatí-Ciales (55-15).

**Saissetia oleae** Bernard

(as *Lecanium*) Busck 00-92: on *Calabassa* tree at Lares, on honey-locust at Adjuntas, on *Guazuma ulmifolia* at Guayama, on *Terminalia catappa* at Mayagüez.

Van Z. (13): on *Erythrina micropteryx*, oleander, orange, *Guazuma ulmifolia*, *Terminalia catappa* and *Solanum torvum* at Mayagüez.

on *Erythrina glauca* (230-13), on *Sicana odorifera* (207-17); on *Terminalia catappa* at Guánica (228-12).

**Aclerda tokionis** Cockerell

Smyth 19-150: on sugar cane.

Wolcott 2:24: 0.1% of sugar cane infected in transmission of mosaic disease by Smyth.

on sugar cane (1-15 det. Sasser, 103-18), at Humacao (144A-16), at Guánica (585-14, 645-14).

## DIASPINAE.

**Chionaspis citri** Comstock

Busck 00-93: on lime at Añasco.

Barrett 03-445: on mango and lime.

Tower 09-24, 25: on orange.

Van Z. (7): on orange at Manatí and Garrochales; *Pilea* sp., *Citrus decumana*, and grapefruit at Garrochales.

Jones 17-9: "this species is one of the most injurious scale pests of the citrus groves of Porto Rico."

Stevenson 18-134, 185, 219: host of *Myriangium duriaei* at Sabana Llana, Río Piedras, Pueblo Viejo, Bayamón, Santurce, Espinosa, Vega Baja and Garrochales; host of *Septobasidium spongia* at Río Piedras, Espinosa, Pueblo Viejo, Campo Alegre, Garrochales, Vega Baja and Bayamón; host of *Tubercularia coccicola* at Espinosa, Río Piedras, Pueblo Viejo and Bayamón.

on orange (101-19), at Mameyes (839-12); on wild orange at Yabucoa (141A-16), at Old Loíza (254-16).

**Chionaspis** sp. near **spartinae** — det. Morrison

on *Sporoholus bertoreanus* at Arecibo playa (163-23).

**Howardia biclavis** Comstock

Busck 00-93: on *Bixa orellana* at San Sebastián and Añasco.

Hooker: on coffee (625), on *Achras sapota* (1251), *Mammea americana* (1252), on *Doryalis caffra* (1649) at Mayagüez.

Van Z. (1230): on *Bixa orellana*, *Achras sapota*, and *Plumiera rubra*.

Stevenson 18-134: host of *Myriangium duriaei* at Río Piedras.

on *Bixa orellana* (263-12), on *Hymenaea courbaril* (37-14), on *Casearia arborea* (232-13), on *Cajanus indicus* (982-13), on *Guettarda scabra* (233-13); on *Chrysophyllum cainito* (829-12), and on *Mammea americana* (835-12) at Mameyes; on *Guettarda scabra* (738-13), and *Cordia* sp. (737-13) at



Dorado; on *Tecoma pentaphylla* (59-14), and *Acalypha wilkesiana* (56-14) at Naguabo; on *Cassia fistula* at Aguirre (75-16); on *Castalioa elastica* at Bayamón (415-16); on *Waltheria americana* at Martín Peña (277-16).

### **Diaspis echinocacti** Bouché

(as *Diaspis calyptroides* Costa, var. *opuntiae* Ckll.) Busck 00-93: at Ponce.

Fernald 03-229, 230: from Porto Rico. The following are given as food plants in the various countries where it occurs: *Opuntia ficus-indica*, *Echinocactus ottonis* and *E. tenuispinus*.

### **Aulacaspis pentagona** Targioni

Busck 00-93: on castor-oil plant at Río Piedras, on unknown tree at Bayamón, on peach at Adjuntas, on honey-locust, on "mahagua" at Fajardo.

Earle 03-458, 467: "very commonly on orange, as well as on various other trees and plants . . . killing a great many of the (pawpaw) trees."

Barrett 03-446: very destructive to peach trees in the east part of the Island; also attacks mulberry and pawpaw.

Tower 07-27: very abundant all over the Island, infesting peach, plum, mulberry, pawpaw, castor bean and other plants.

Jones 15-4: on okra and pepper.

Johnston 15-28: host of *Myriangium duriaei* at Pueblo Viejo, Santurce, and Río Piedras.

Jones 17-9: the papaya suffers especially from its attacks.

Cotton 18-303: on okra.

Stevenson 18-134: host of *Myriangium duriaei* at Río Piedras and Sabana Llana.

Hooker (1651): on *Salix humboldtiana* at Mayagüez.

Van Z. (1248): on *Carica papaya*, *Hyptis* sp., *Erythrina micropteryx*, *Nerium oleander*, *Capsicum* sp., orange; on *Mangifera indica* at Mayagüez; on *Paritium tiliaceum* at Mameyes and Adjuntas; on *Manihot utilissima* at Añasco.

on "malva" (290-12), on *Carica papaya* (684-12), on *Cajanus indicus* (409-13), on *Hibiscus esculentus* (923A-13), on garden pepper (924A-13), on *Trema micrantha* (982-14), on *Carica papaya* (11-16), on cotton (12-16), on *Acalypha wilkesiana* (471-16), on *Solanum torvum* (439-17), on *Ricinus communis* (776-19), on *Hibiscus sabdarifa* (354-21); on *Salix* sp. at Ponce (165-12); on *Urena lobata* at Dorado (739-13), and at Bayamón (140-15); on *Bryophyllum pinnatum* at Comerío (774-13); on *Mammea americana* at Naguabo (54-14); on *Hyptis* sp. at Maricao (791-14); on *Trema micrantha* at Juana Díaz (83-15); on *Maga grandiflora* at Espinosa (84-15); on *Ricinus communis* at Hormigueros and Guánica (85-15), at Ciales (788-13); on *Carica papaya* at Guánica (255-15, 261-15).



**Hemichionaspis aspidistrae** Signoret

on leaves of fern, *Nephrolepis exaltata* var. *bostoniensis* (104-16 det. Sasser).

**Hemichionaspis buxi** Bouché

on *Areca lutescens* (20-14), on *Acrocomia media* (22-14), on *Areca* sp. (116-15); on leaves of a tree epiphyte belonging to the family *Bromeliaceae* at Mameyes (832-12); on *Philodendron* sp. at Ciales (787-13); on ornamental palm at Trujillo Alto (128-22 det. Morrison); on cotton at Maunabo (5-22 det. Ferris).

**Hemichionaspis minor** Maskell

Busck 00-93: on eggplant at Cataño; on *Guazuma ulmifolia* at Guayama.

Jones 15-4: on eggplant.

Jones 17-10: "a common species sometimes found in company with *Saissetia nigra* (Nietn.), and *S. hemisphaerica* (Targ.)

--- on *Pithecolobium saman* at Mayagüez.

Cotton 18-301: attacks stems and branches of eggplant.

Stevenson 18-134: host of *Myrangium duriaei* at Palo Seco.

Van Z. (1402): on eggplant, *Guazuma ulmifolia*, cotton and *Asparagus sprengeri*.

on eggplant (925A-13), on *Valerianodes jamaicensis* (334-12, 72-15); on *Gomphrena globosa* (121-15), on *Capsicum* sp. (122-16), on undetermined plant (550-12), on mulberry (527-23); on *Gossypium barbadense* at Guánica (210-13), (480-13); on *Aeschynomene sensitiva* at Naguabo (55-14); on *Melia azedarach* at Fortuna (near Ponce) (396-13); on ornamental croton (*Codiaeum* sp.) at Naguabo (92-11); on *Solanum torvum* (475-12), on *Triumfetta semitriloba* (477-12), on *Anona reticulata* (35-15) and *Melia azedarach* (788-12) at Luquillo; on *Lantana involucrata* at Mameyes (827-12); on *Asparagus sprengeri* at Mayagüez (754-14); on *Sesbania grandiflora* at Garrochales (197-16); on *Cajanus indicus* at Old Loíza (256-16); on unknown liana at Plantaje (46-16).

**Leucaspis indica** Marlatt, C. L., in Bur. Ent. (Tech. Ser.) Bul. 16, pt. II, pp. 26-27, pl. VII, fig. 2: "On mangoes imported from India, at Miami, Fla. and from Mayagüez, Porto Rico," TYPE from Porto Rico.

Jones 17-11: collected on mango (*Mangifera indica*) at Mayagüez.

**Aspidiotus (Aonidiella) cocotiphagus** Marlatt—det. Morrison.

on coconut palm fronds from Pt. Cangrejos (GNW); on *Jasminum sambac* at Monte Flores (301-23).

**Aspidiotus cyanophylli** Signoret

Van Z. (1606): on *Aleurites cordata*, banana, *Clusia rosea*, *Eugenia malaccensis*, *Dillenia indica*, *Vitex divaricata*, *Nerium*

*oleander*, *Eriobotrya japonica*, *Pischofia* sp., *Washingtonia robusta*, *Eucalyptus* sp., *Barringtonia* sp., *Viola* sp., *Monstera deliciosa*, *Albizia stipulata*, *Piper* sp., *Mangifera indica*, and *Citrus decumana*.

on *Eucalyptus* at Naguabo (52-14).

#### **Aspidiotus destructor** Signoret

Cockerell, T. D. A., 95-261: Can. Ent., XXVII.

Busck 00-93: on banana leaves at Cataño, San Juan and Arroyo.

Barrett 03-447: at Ponce many of the coconut trees were dead or dying from attacks of this coccid.

Van Z. (1229): on *Cocos nucifera*, *Phoenix dactylifera* and *Musa* sp.

Stevenson 18-207: host of *Botrytis rileyi* at Punta Cangrejos.

on *Grevillea robusta* (288-12), on *Psidium guajava* (286-12), on *Cocos nucifera* (352-12), on *Musa paradisiaca* var. (686-12), on *Persea gratissima* (18-16), on screw palm, *Pandanus* sp., (117-15), on Euphorbiaceous plant (86-16), on *Cocos nucifera* (134-16), on *Psidium guajava* (2-17), on *Terminalia catappa* (93-22 det. Ferris); on *Cocos nucifera* at Santurce (31-11); on *Persea gratissima* at Mameyes and Guayama (82-13); on *Anona palustris* at Algarrobo (793-14); on *Mammea americana* (25-16), and *Cocos nucifera* (26-16) at Plantaje; on pomgranate at Aguirre and Guánica (193-16); on undetermined plant at Barceloneta (221-16).

#### **Aspidiotus forbesi** Johnson

Fernald 03-259, 269: occurs in Porto Rico.

Jones 17-12: "with the possible exception of 'Jazmines' no tropical plants are included in the list.

#### **Aspidiotus lataniae** Signoret

Hooker (1635): on *Castilla* sp. at Mayagüez.

on *Jasminium sambac* at Monte Flores (301-23 det. Morrison).

#### **Aspidiotus sacchari** Cockerell

Van Dine 11-19, 31; 12-22; 13-34; 13-251, 257: on sugar cane.

Hood, J. D., in *Insecutor Insectiae Menstruus*, Vol. I, No. 6, pp. 65-70, June, 1913: taken with *Odonaspis* sp. on stalks of "malojillo" (*Panicum barbinode*) at Guánica.

Jones 17-12: on sugar cane at Canóvanas.

Smyth 19-150: on sugar cane.

Wolcott 21-35: on sugar cane.

on sugar cane (98-12 det. Van Dine); on sugar cane at Guánica (14-10), at Fortuna (53-10), at Fajardo (21-11), (81-11), at Humacao (99-12).

#### **Pseudaonidia articulatus** Morgan

Busck 00-13: on orange leaves at El Yunque, February 18; about 2,000 feet altitude.

Barrett 03-445: on citrus.

Tower 08-38; Tower 09-25: on orange.

Van Z. (15): on orange.

Jones 17-12: on *Anona muricata* at Río Piedras.

Stevenson 18-219: host of *Microcera fujikuroi* at Pueblo Viejo. on *Eugenia jambos* (437-12), on wild orange (16-16), on *Eucalyptus* sp. (52-14) at Naguabo; on *Ficus nitida* at San Juan (58-15); on grapefruit at Trujillo Alto (36-15); on wild orange on Carolina road (48-15); on *Chrysophyllum* sp. at Garrochales (13-16).

### ***Pseudaonidia tesserata* de Charmoy**

on garden rose (441-17 det. Cotton); at Mameyes (838-12 det. Sasscer) on rose; on *Inga laurina* at Lares (6-22 det. Ferris).

### ***Chrysomphalus aonidum* Linnaeus**

Busck 00-93: on *Terminalia catappa* at San Juan; on *Anona muricata* at San Juan; on oleander at Ponce; on *Musa* at Caguas.

(as *Aspidiotus ficus*) Earle 03-459; Barrett 03-445:

(as *Chrysomphalus ficus*) Tower 07-25, 26; 08-32; 09-24: on orange.

Tower 11-14, 15: on orange and lemon.

Carnes, E. K., in Bull. State Comm. Hort., Vol. I, No. 8, 1912, Sacramento, California, on p. 398: received from Porto Rico.

Johnston 15-29: host of *Sphaerostilbe coccophila* at Bayamón.

Stevenson 18-219: host of *Microcera fujikuroi* at Pueblo Viejo.

Van Z. (8): on orange, lemon, "pomelo", rose, *Agave sisalana*, *Cocos nucifera*, oleander, *Anona muricata*, *Musa* sp. and *Terminalia catappa*.

on *Ficus nitida* at San Juan (58-15); on grapefruit at Carolina (115-15); on *Gemmingia chinensis* at Bayamón (147-15); on leaves of *Cocos nucifera* at Guánica (171-16); on wild orange at Ponce (52-22).

### ***Chrysomphalus aurantii* Maskell**

Busck 00-93: on *Anona muricata* at San Juan; on *Anona muricata* at Ponce.

Barrett 03-445: reported it as an enemy of citrus stock, with note, "rare but apparently spreading."

Van Z. (14): on orange and rose.

Smyth 19a-125: on *Murraya exotica*.

### ***Chrysomphalus dictyospermi* Morgan**

on *Mangifera indica* (530-12), on *Cocos nucifera* (864-14); on *Cycas revoluta* at Naguabo (53-14, 333-17).

**Chrysomphalus personatus** Comstock

(as *Aspidiotus*) Busck 00-93: on plantain leaves at Caguas; on *Anona muricata* at San Juan; on banana leaves at Cataño; on coconut palm at Mayagüez.

Van Z. (1228): on coconut palm, mango, *Bertholonia excelsa*, *Inga laurina*, *Musa* sp. and *Anona muricata*.

Jones 17-13: on *Mangifera indica* at Santa Isabel; on *Ficus* sp. at Mameyes.

on *Ficus* sp. (19-22, 549-12); on *Eugenia jambos* (237-13), on *Laguncularia racemosa* (13-14), on *Banisteria laurifolia* (859-14), on *Calophyllum calaba* (148-15), on *Anona* sp. (598-16); on *Cocos nucifera* at Santurce (213-11); on *Mammea americana* at Mameyes (836-12); on *Ficus nitida* at San Juan (58-15); on *Eucalyptus* sp. at Naguabo (52-14); on *Mammea americana* at Plantaje (25-16); on *Jasminum sambac* at Fajardo (143A-16); on undetermined plant at Canóvanas (192-16); on *Mammea americana* at Cupey Alto (417-16); on *Symplocos latifolia* at Bayamón (418-16); on *Cocos nucifera* at Point Cangrejos (119-21 det. Morrison).

**Pseudischnaspis bowreyi** Cockerell

Hooker (1652): on asparagus at Mayagüez.

Van Z. (1256): on rose and *Persea gratissima*.

on *Agave sisalana* (520-17 det. Dietz).

**Targionia biformis** Cockerell

Hooker (1236): on *Bromelia pinguin* at Mayagüez.

Van Z. (1647): on *Agave sisalana* at Mayagüez.

Jones 17-13: on *Agave sisalana*, *Persea gratissima* and *Mangifera indica* at Río Piedras; on *Cycas revoluta* at Naguabo.

on *Bromelia pinguin* at Mameyes (824-12), at Naguabo (142A-16), at Canóvanas (195-16); on *Agave sisalana* on Trujillo Alto road (93-16), at Salinas (77-16), at Cabo Rojo (3-16) and at Cayey (GNW); on *Pedilanthus tithymaloides* at Fortuna (164-16); at Guánica (130-23).

**Pseudoparlatoria ostreata** Cockerell

Van Z.: on *Solanum seaforthianum* and *Acalypha* sp. at Mayagüez.

**Lepidosaphes beckii** Newman

(as *Mytilaspis citricola*) Earle 03-457, 458; Barrett 03-445:

Tower 07-26; 08-32, 33; 09-23, 24; 10-24, 25: on orange and citrus. Tower 11-13, 15: on citrus.

Carnes 12-398: from Porto Rico.

Van Z. (6): on orange and lemon.

Johnston 15-13: host of *Aschersonia turbinata* at Río Piedras.

Johnston 15-29: host of *Scolecnectria coccicola* at Pueblo Viejo, and Río Piedras.

Johnston 15-29: host of *Sphaerostilbe coccophila* at Río Piedras.

Jones 17-14: "this species has been more often mentioned as

a pest of citrus orchards than any other scale insect . . . the species was taken on ornamental croton (*Codiaeum* sp.) at Río Piedras by the writer."

Cotton, R. T., "Scale-Feeding Habits of a Porto Rican Millepede, *Rhinocritus arboreus* Saussure." Jour. Dept. Agr. P. R., Vol. I, No. 3, July, 1917, pp. 175-176: " . . . about a dozen (of these millepedes) placed on several small grapefruit trees that were heavily infested with purple scale. . . . At the end of two weeks the trees were perfectly clean and free from scales and the bark took on a fresh green color."

Stevenson 18-185: host of *Septobasidium spongia* at Río Piedras, Espinosa, Pueblo Viejo, Campo Alegre, Garrochales, Vega Baja and Bayamón.

Stevenson 18-134: host of *Myrangium duriaei* at Sabana Llana, Río Piedras, Pueblo Viejo, Bayamón, Santurce, Espinosa, Vega Baja, Garrochales.

Stevenson 18-150: host of *Scoleconectria coccicola* at Río Piedras, Pueblo Viejo, Bayamón, Espinosa, Garrochales and Mayagüez.

Stevenson 18-150: host of *Sphaerostilbe coccophila* at Río Piedras, Pueblo Viejo, Bayamón, Vega Baja, Manatí, Espinosa, Garrochales, and Mayagüez.

Stevenson 18-219: host of *Microcera fujikuroi* at Bayamón, Mayagüez and Pueblo Viejo.

Stevenson 18-219: host of *Tubercularia coccicola* at Espinosa, Río Piedras, Pueblo Viejo, Bayamón.

Smyth 19a-126: on *Murraya exotica*.

on *Murraya exotica* (19-18); on wild orange at Old Loíza (254-16).

### **Lepidosaphes lasianthi** Green

on *Croton humilis* (548-12 det. Sasser).

### **Ischnaspis longirostris** Signoret

Busck 00-93: on coconut palm at Caguas, Cataño, Mayagüez, and Arroyo.

Hooker (1654): on *Ficus repens* at Mayagüez.

Van Z. (1604): on *Roystonea borinquena*, *Washingtonia robusta*, coffee, *Pterocarpus draco*, *Bignonia unguis-cati*, at Mayagüez.

on *Ixora ferrea* (756-14), on *Acrocomia media* (757-14), on *Dalbergia monetaria* (79-15), on *Anona* sp. (598-16); on *Citharexylum fruticosum* at Naguabo (911-14); on *Asparagus sprengeri* at Mayagüez (754-14); on *Jasminum sambac* at Santurce (69-21), on *Cocos nucifera* (on outside husk of fruit) at Mayagüez (144-21, 436-21); on ornamental palm at Trujillo Alto (128-22 det. Morrison).

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## "INSECTAE PORTORICENSIS"

### CORRECTIONS AND ADDITIONS.

- p. 2. for "January, 1924," read "Actual Date of Publication, March 5, 1924."
- p. 64. for "*Anagrus*," read "*Anagris*," and for *Tetragonochlora*, read *Tetragonochora*.
- p. 69. for "*Uteles*," read "*Uteles*."
- p. 142. remove parenthesis from *Ageronia ferentina* Godart, and omit the last sentence. Add "two adults collected by F. Sein on trunks of *Inga laurina* in old coffee grove near Aibonito, January 29, 1924."
- p. 160. under *Chloridea virescens* Fabr., add "eating green gan-  
dulis out of pods at Loíza, reared by F. Sein (5-24)."
- p. 273. after *Neomalaxa flava* Muir, instead of "— det. Muir,"  
add, ",F, in Proc. Hawaiian Ent. Soc., Vol. 3, No. 5 (1918) p.  
426, TYPE from Mayagüez, Porto Rico."
- after *Nilaparvata wolcottii* Muir, instead of "MS," add,  
",F. & Giffard, W. M., in 'Studies in North American Delpha-  
cidae' Bull. 15 (Entomological Series) Expt. Sta. Hawaiian S.  
P. A., January 16, 1924, p. 17."
- p. 280. under *Asterolecanium pustulans* Cockerell, add "on peti-  
oles of leaves and on trunk of young apple tree at Bayamón  
(7-24)."

